Vol. 1035 Number 4

OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

October 25, 1983 Volume 1035 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.

THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.

GENERAL INFORMATION concerning PATENTS.

GENERAL INFORMATION concerning TRADEMARKS.

PRINTED COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty Information

For information concerning the PCT member countries see the notice appearing in the Official Gazette at 1017 O.G. 10 on Apr. 13, 1982. For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States, see the notice in the Official Gazette of Sept. 28, 1982 at 1022 O.G. 52.

Note that the domestic PCT fees have been increased as of Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published at 1021 O.G. 11 on Aug. 10, 1982. Also note that the international PCT fees have changed as of Jan. 1, 1983 and the Search Fee for the European Patent Office as Searching Authority changed as of Jan. 22, 1983. The notice regarding the change in international fees and the Search Fee for the European Patent Office appeared at 1025 O.G. 27, on 28 Dec. 1982. The current schedule of fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	670.00
International Fees	
Basic Fees (first 30 pages)	265.00
Basic Supplemental Fee (for each page over 30)	5.00
Designation fee (for each national or regional office)	65.00

GERALD J. MOSSINGHOFF,
Dec. 3, 1982. *Commissioner of Patents and Trademarks.*

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,278,528, Re. S.N. 482,404, Filed Apr. 6, 1983, Cl. 204/298, RECTILINEAR SPUTTERING APPARATUS AND METHOD, Manfred R. Kuehnle, et al., Owner of Record: *Coulter Systems, Bedford, Mass.*, Attorney or Agent: Sidney N. Fox, Ex. Gp.: 114

4,285,518, Re. S.N. 526,454, Filed Aug. 25, 1983, Cl. 273/001.509, BASKETBALL GOAL, John M. Pearo, Owner of Record: *Inventor,* Attorney or Agent: Robert B. Hughes, Ex. Gp.: 334

4,286,320, Re. S.N. 524,629, Filed Aug. 19, 1983, Cl. 364/200, DIGITAL ECOMPUTING SYSTEM HAVING AUTO-INCREMENTING MEMORY, Granville E. Ott, Owner of Record: *Texas Instruments, Dallas, Tex.*, Attorney or Agent: Leo N. Heiting, Ex. Gp.: 237

4,312,790, Re. S.N. 526,257, Filed Aug. 25, 1983, Cl. 252/455.2, AROMATICS PROCESSING CATALYSTS, Stephen A. Butter, et al., Owner of Record: *Mobil Oil Corp., New York, N.Y.*, Attorney or Agent: Alexander J. McKillop, Ex. Gp.: 116

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.21(b)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,926,832, Reexam. No. 90/000,450, Requested: Sept. 28, 1983, Cl. 252/181.6, GETTERING STRUCTURE, Aldo Barosi, Owner of Record: *Requester,* Attorney or Agent: David R. Murphy, Ex. Gp.: 223, Requester: S.A.E.S. Getters, Arlington, Va.

4,024,873, Reexam. No. 90/000,446, Requested: Sept. 19, 1983, Cl. 604/96, BALLOON CATHETER ASSEMBLY, William T. Antoshkiw, et al., Owner of Record: *Becton, Dickinson & Co., East Rutherford, N.J.*, Attorney or Agent: Kane, Dalsimer, et al., Ex. Gp.: 336, Requester: Richard J. Ridrick, Paramus, N.J.

Patent and Trademark Office to Sponsor Design Contest for Patent Grant Document

The Patent and Trademark Office is sponsoring a design competition to select a new design for its patent grants to reflect the revolutionary advances in high technology and the automation of the agency.

The present design has been in use for much of this century. The grant is in the form of a four-page folder with the patent printed separately and inserted inside. Pages 2, 3 and 4 of the folder are blank. A ribbon is inserted through eyelets on the left-hand side towards the fold, then tied and secured with a seal on the front.

A design is needed for a cover 8 by 12 inches, which includes a border in a contemporary style.

——The design should be limited to two colors on a light-colored paper stock.

——It should eliminate the hand-tied ribbon, but could include a ribbon crimped under an embossed, adhesive seal 2 inches in diameter.

——It should include the following words:

THE UNITED STATES OF AMERICA

There has been presented to the

COMMISSIONER OF PATENTS AND TRADEMARKS

An application for a patent for a new and useful invention. The title and description of the invention are contained in the specification and any drawings, a copy of which is annexed to and made a part of this patent. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law. Therefore this

UNITED STATES PATENT

Grants to the person or persons having title to the invention, as recorded in the Patent and Trademark Office, and their heirs or assigns, the right to exclude others from making, using or selling the invention throughout the United States of America for the term of seventeen years from the date of this patent, subject to the payment of maintenance fees as provided by law.

I have caused the seal of the Patent and Trademark Office to be Affixed this day of

——The design should also include a place for the signature of the Commissioner and the attesting officer, and for the seal and the patent number.

——The words appearing above in capital letters should appear in display type and should be indicated on the layout. Text lines may be enumerated. Type faces, weight and leading should be specified, and a sample line or lines of body type included. If any hand lettering is to be used in place of type it should be included on the layout.

A comprehensive layout should be submitted on bristol board or illustration board, with a protective flap furnished. The winner should be prepared to complete, and will be compensated for, final layout work. Typesetting of the text for the final layout will be done by the government.

Entries must be postmarked no later than Nov. 21, 1983. They will be judged by an impartial panel selected from representative groups with an interest in design and the patent system. The winner will receive $500 and an invitation to the National Inventors Day ceremony at the Patent and Trademark Office Feb. 12, 1984, when the winning design will be unveiled. If you live outside the Washington area, we will pay your way to the Office for the ceremony (subject to Government travel regulations).

To obtain a brochure with contest rules and an entry blank, contact the Office of Public Affairs, CP3-1D01, Patent and Trademark Office, Washington, D.C. 20231. Telephone (703) 557-3428.

DONALD J. QUIGG,
Deputy Commissioner of Patents and Trademarks.

Sept. 23, 1983.

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished by the Commissioner of Patents and Trademarks on or before Nov. 28, 1983:

Baird, Wanaell M., 2150 N. Lincoln Park West, #712, Chicago, Ill. 60614

Cohen, Alan C., 100 Wells St., #608, Hartford, Conn. 06103

Giaccherini, Thomas N., 51 Schuyler Ave., #5D, Stamford, Conn. 06902

Gorman, George C., 952 The Alameda, Berkeley, Calif. 94707

WILLIAM FELDMAN,
Director, Office of Enrollment and Discipline.

Errata

The following registration numbers were inadvertently omitted from the "Trademark Registrations Canceled" section of the Official Gazette of Apr. 26, 1983:

SECTION 7(d)

775903	SLIM DIET	U.S. CLASS	45
816279	TONGA	U.S. CLASS	51
1096318	MAMA REGINA	U.S. CLASS	42
1099620	COUNTRY ROADS	U.S. CLASS	25
1111080	WILD WILD WET	U.S. CLASS	41
1111081	THE WILD WILD WET and design	U.S. CLASS	41
1167900	THERMO-SDLV	U.S. CLASS	1
1171409	ADVER-TEE'S and design	U.S. CLASS	25

SECTION 18

543898	TRIDENT and design	U.S. CLASS	46
544029	RUFFLE	U.S. CLASS	46
655283	GALAXY	U.S. CLASS	39
732783	NERVE FINDER	U.S. CLASS	44
757011	MICHELLE D'ARCY	U.S. CLASS	47
767605	GOLDEN ANCHOR and design	U.S. CLASS	39
876139	FANCY FIXIN'S	U.S. CLASS	46
964925	QUICK SHOP	U.S. CLASS	101
988650	TUFF TOWELS	U.S. CLASS	42
1025732	BOLIDTAN	U.S. CLASS	19
1033492	AQUARIST	U.S. CLASS	1
1040343	BARNES	U.S. CLASS	25
1042179	ROAD	U.S. CLASS	9
1045667	KROC-O-BEANS	U.S. CLASS	29
1045668	KROC-O-FRIES	U.S. CLASS	29
1052630	YUMMY'S	U.S. CLASS	42
1053466	KROC-O-KLAMS	U.S. CLASS	29
1067332	BLAZER	U.S. CLASS	28
1069682	NIGHTLIGHT	U.S. CLASS	3
1072669	BAGS R' US	U.S. CLASS	18
1073902	BACITRACIN-MD	U.S. CLASS	5
1073925	TITAN	U.S. CLASS	7
1074440	TITAN TIP	U.S. CLASS	7
1078156	ELEPHANT EARS	U.S. CLASS	42
1082007	AUTO SOUND NORTH and design	U.S. CLASS	37
1099096	The GRIPPER	U.S. CLASS	1
1099554	ROOF-GUARD and design	U.S. CLASS	19
1108294	COOKIE MACHINE and design	U.S. CLASS	42
1112029	CHEDDAR BURGER	U.S. CLASS	29
1115461	MONSTER	U.S. CLASS	28
1125289	CHINA SILK	U.S. CLASS	3
1127113	GAME-TIME	U.S. CLASS	41
1094582	TITAN	U.S. CLASS	28
1138288	THERMAL-SPOT	U.S. CLASS	9
1146536	MARLAND	U.S. CLASS	7
1149483	SPECIAL RISKS	U.S. CLASS	36
1161931	NORTHWOOD	U.S. CLASS	19

Consequently, the above identified registrations are cancelled.

MARK NEWMAN,
Director Trademark Examining Operation.

Errata

"All reference to Patent No. D. 268,759 to Willard J. Hoebeke of Florida for 'FLUID METERING VALVE' appearing in the Official Gazette of Apr. 26, 1983 should be deleted since no patent was granted."

"All reference to Patent No. 4,391,033 to Satoshi Shinozaki of Japan for 'METHOD OF MAKING V-ISOLATION GROOVES BY OVERFILLING WITH POLYCRYSTALLINE SILICON OF GRADED CONDUCTIVITY AND ETCHING' appearing in the Official Gazette of July 5, 1983 should be deleted since no patent was granted."

"All reference to Patent No. 4,394,154 to Richard J. Anderson, et al. of Calif. for 'SUBSTITUTED PYRIDYLOXYBENZO-2,1,3-OXADIAZOLES AND -THIADIAZOLES AND *N*-OXIDES THEREOF' appearing in the Official Gazette of July 19, 1983 should be deleted since no patent was granted."

Status of PTO Services

The following is an update of the status of PTO services as of September 2, 1983:

Service Item	FY 1983 Performance Goal (Calendar Days)	Actual as of November 5, 1982	Actual as of September 30, 1983
Filing Receipts:			
Patents	22	56	21
Trademarks	30	49	30
Patent Copies:			
Window Coupons	5	70% within 5 days	96% within 5 days
Mail Coupons	29*	95% within 29 days	100% within 22 days
Letter Orders	34*	3% within 34 days	100% within 24 days
Certified Copies:			
Trademark Registrations	30	19	18
Applications-As-Filed	20	98% within 15 days	98% within 10 days
File-Wrapper/Contents	N/A	86% within 20 days	100% within 20 days
Walk-up Certification	1	99% within 1 day	99% within 1 day
Trademark Search Library:			
Filing Drawings	21	29	16
Filing Reg. Certificates	3	8	3
Assignments:			
Patents	25	80	16
Trademarks	25	85	9
Avg. Days from Issue Fee Payment to Issue Date	90-100		91
Patent Official Gazette:			
In Bookstore	Issue Date	On Schedule	On Schedule
Mailed	Issue Date		Avg. 1 day late
Patent Grants Mailed	Issue Date	On Schedule	Avg. 1 day late
Patent Copies Available	Issue Date		99%
Trademark Official Gazette:			
In Bookstore	Issue Date	On Schedule	On Schedule
Mailed	Issue Date		On Schedule
Trademark Regs. Mailed	Issue Date	On Schedule	On Schedule

*Goal includes mail processing and delivery time.

IMPROVEMENTS TO SERVICES

- *Summary of Improvements During FY 1983* — Substantial progress was made over the past year in improving services rated in the 1982 User Survey as poor or fair. As reported in the last Official Gazette of each month, actions were taken to improve timeliness of services, integrity of files, search room working conditions, and quality of photocopy and microfilm reader/printer services.

  As shown in the table above, significant improvements were made in the timeliness of key services. Trademark, patented, and abandoned file histories from the PTO file repositories are being provided within three hours for 90–95% of the files. Files from the Federal Records Center are being provided within five days for most requests. In addition, 65% of all files requested by official search are found within 30 days. Almost all of those not found are old files controlled by the Federal Records Center.

  Several file integrity checks were made in many areas including the Trademark File Repository and all abandoned and patented files in the patent examining groups. Clear accountability for file integrity was established by assignment of individuals to specific areas of the file repositories. An automated file request system was implemented in April 1983 for patent examiners. This allows the Contact Representative staff to dedicate more of their time to handling requests from the public. Over the next year, we hope to obtain additional computer resources to automate file requests from the public and automatically monitor service response times.

  The Patent Search Room working conditions were improved by providing additional space, improving air temperature control and circulation, and establishing a quiet area. Compliments of our lessor, Charles E. Smith, new carpet, drapes and wall covering were installed. An order for new chairs, approved by the search room users, was placed with the General Services Administration.

  Photocopy and microfilm reader/printer quality was improved. New lenses were installed on existing machines and new machines were placed in service. Twenty-three photocopiers were replaced throughout the public areas, significantly improving copy quality.

  More improvements are planned for the coming year.

• *File Maintenance Contract*—Vanguard Technologies Corporation has recently been awarded a contract for the maintenance of PTO files in the Eads Street and Fern Street Files Repositories, the Public Search Room, the Trademark Search Library and the Scientific Library. Assumption of these duties by Vanguard, effective today, should have little effect on present operations since (1) very few changes in procedures are planned, (2) many of the individuals performing these functions for the PTO were hired by Vanguard and (3) all aspects of the contractor's operations will be closely monitored to ensure compliance with the rigid specifications contained in the contract.

Oct. 3, 1983.

THERESA A. BRELSFORD,
Assistant Commissioner for Administration.

Notice to All Deposit Account Holders

Beginning Oct. 15, 1983, please *mail deposit account remittances only* to:

Patent and Trademark Office
P.O. Box 70541
Chicago, Ill. 60673

To expedite credit to your deposit account and the treasury, and arrangement has been made between the Patent and Trademark Office, Treasury Department, and the First National Bank of Chicago utilizing a special "lockbox" depositary to receive deposit account remittances.

Checks should continue to be made payable to the Commissioner of Patents and Trademarks and be accompanied by *the top portion of your deposit account statement.* Submit only remittances for deposit accounts to this new address. All other correspondence should continue to be addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

LEONARD L. NAHME,
Director Office of Finance.

PATENT NOTICES

Certificates of Correction for the Week of Oct. 25, 1983

Re. 31,112	4,366,144	4,386,523	4,396,049
Re. 31,236	4,366,308	4,386,906	4,396,212
D. 268,807	4,366,977	4,387,030	4,396,345
D. 269,756	4,367,399	4,387,164	4,396,965
D. 270,062	4,367,864	4,387,931	4,396,994
D. 270,240	4,369,779	4,388,111	4,397,403
D. 270,261	4,371,239	4,388,297	4,397,404
4,207,274	4,371,240	4,388,470	4,397,478
4,240,937	4,371,241	4,388,616	4,397,749
4,261,109	4,371,382	4,388,633	4,397,860
4,269,859	4,373,246	4,388,964	4,398,896
4,284,869	4,375,672	4,389,059	4,399,144
4,295,732	4,375,934	4,389,252	4,399,350
4,299,478	4,376,023	4,389,910	4,399,559
4,316,986	4,376,051	4,390,120	4,399,589
4,324,530	4,379,315	4,390,404	4,399,724
4,337,583	4,380,020	4,391,103	4,400,105
4,339,975	4,380,393	4,391,670	4,400,652
4,341,118	4,381,029	4,392,132	4,400,667
4,350,895	4,381,520	4,392,211	4,400,814
4,355,594	4,383,098	4,392,782	4,401,214
4,357,089	4,383,885	4,393,046	4,401,447
4,357,709	4,384,725	4,393,833	4,401,623
4,359,088	4,385,171	4,394,418	4,401,736
4,359,561	4,386,065	4,394,602	4,402,061
4,363,406	4,386,142	4,395,253	
4,365,500	4,386,242	4,395,461	

Disclaimers

3,713,435.—*Roman Szpur,* Dayton, Ohio. PICKUP ELECTRODE WITH RIGID ELECTROLYTE CUP. Patent dated Jan. 30, 1973. Disclaimer filed Aug. 25, 1983, by the assignee, *NDM Corp.*

Hereby enters this disclaimer to all claims of said patent.

4,139,348.—*Mitchell E. Swartz,* Malden, Mass. ELECTROCHEMICAL PROCESS AND APPARATUS TO CONTROL THE CHEMICAL STATE OF A MATERIAL. Patent dated Feb. 13, 1979. Disclaimer filed Sept. 9, 1981, by the assignee, *Massachusetts Institute of Technology.*

Hereby enters this disclaimer to claim 53 of said patent.

4,229,854.—*Jesse C. Johnston, Jr.,* Carroll, Ohio. SOOT BLOWER CONSTRUCTION. Patent dated Oct. 28, 1980. Disclaimer filed Sept. 1, 1983, by the assignee, *The Babcock & Wilcox Co.*

Hereby enters this disclaimer to claims 1 and 4 of said patent.

Disclaimers and Dedications

3,805,769.—*Robert W. Sessions,* Hinsdale, Ill. DISPOSABLE ELECTRODE. Patent dated Apr. 23, 1974. Disclaimer and Dedication filed Feb. 4, 1981, by the assignee, *Minnesota Mining & Manufacturing Co.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

4,123,415.—*Allen D. Wambach,* Evansville, Ind. REINFORCED THERMOPLASTIC POLYESTER COMPOSITIONS HAVING IMPROVED RESISTANCE TO HEAT DEFLECTION. Patent dated Oct. 31, 1978. Disclaimer and Dedication filed July 27, 1983, by the assignee, *General Electric Co.*

Hereby disclaims and dedicates to the Public the remaining term of said patent.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The libraries listed herein, designated as patent depository libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent months or years in some libraries to all or most of the patents issued since 1870, or earlier, in other libraries.

These patent collections are open to public use and each of the patent depository libraries, in addition, offers the publications of the patent classification system (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Depending upon the library, the patents may be available in microfilm, in bound volumes of paper copies, or in some combination of both. Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the patent depository libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Birmingham Public Library	(205) 254-2555
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
California	Los Angeles Public Library	(213) 626-7555 Ext. 273
	Sacramento: California State Library	(916) 322-4572
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Illinois	Chicago Public Library	(312) 269-2865
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Massachusetts	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 214, Ext. 215
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7814
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 930-0850
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1321**
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-7722 Ext. 226
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 528-2957
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

**Call only between the hours of 10:00 a.m. and 5:00 p.m.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF April 2, 1983

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—D. E. TALBERT, Director ..... Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metallurgical Apparatus; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	1-16-81
GENERAL ORGANIC CHEMISTRY, GROUP 120—C. E. VAN HORN, Director ..... Heterocyclic Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	11-20-81
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—J. O. THOMAS, JR., Director .... Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g., Coating; Molding; Ink; Prosthdontics; Adhesive and Abrading Compositions; Molding, Shaping, Treating Process, and Apparatus Therefor; Irradiation (Part); Bleaching; Dyeing; Leather, Fur and Textile Treating Compositions.	3-1-82
COATING, LAMINATING AND PHOTOGRAPHY, GROUP 160—S. N. ZAHARNA, Director ..... Coating: Processes, Apparatus and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; and Photography.	3-09-82
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—R. F. WHITE, Director ..... Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	1-12-82
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—S. W. ENGLE, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Horology; Acoustics; Recorders; Weighing Scales.	5-22-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—KENNETH L. CAGE, Director ..... Ordnance, Firearms and Ammunition; Lubrication; Illumination; Nuclear Reactors; Acoustics, Communications, Optics; Radar; Directional Radio; Torpedoes; Seismic Exploring; Cathode Ray Tube Circuitry; Cryptography; Laser Devices; Radioactive Materials; Powder Metallurgy, Rocket Fuels; Special, Fuel, Explosive and Thermic Compositions; Thermal and Photoelectric Batteries.	3-30-81
INFORMATION TRANSMISSION, STORAGE, AND RETRIEVAL, GROUP 230—EARL LEVY, Director ..... Communications; Multiplexing Techniques; Television; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	1-05-81
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director ..... Receptacles; Bearings; Joint Packing; Conduits; Switches; Presses; Plumbing Fixtures; Textile Spinning; Cleaning; Food Treating; Agitating; Centrifugal Separating; Geometrical Instruments; Sound Recording; Image Projectors; Web Feeding; Winding and Reeling; Cable Hoists; Measuring and Testing; Indicating; Fluent Material Handling; Shaft; Impellers; Rotary Fluid Motors.	5-12-81
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director ..... Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	8-25-80
DESIGN, GROUP 290—KENNETH L. CAGE, Director ..... Industrial Arts; Household, Personal and Fine Arts.	1-30-81
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director ..... Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	5-18-81
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—STEPHEN G. KUNIN, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion-Bonding, Metal Founding; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks; Fishing, Etc.; Butchering; and Books and Printed Matter.	7-27-81
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—R. E. AEGERTER, Director ..... Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Plants; Harvesting; Earth Working and Excavating; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Information Dissemination.	8-27-82
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—D. J. STOCKING, Director ..... Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Couplings; Gearing; Fluid Handling and Control; Lubrication.	11-17-80
GENERAL CONSTRUCTIONS, TEXTILES, MINING AND GEARING, GROUP 350—A. L. SMITH, Director ..... Building Structures; Racks; Cabinets; Closures; Supports; Furniture; Fasteners; Locks; Pipe Couplings; Joints; Miscellaneous Hardware; Textiles; Sewing Machines; Apparel; Footwear; Earth Engineering; Earth Drilling; Mining; Wells; Roads; Bridges; Tool Driving; Gearing; Machine Elements; Clutches.	9-17-80

Expiration of patents: The patents within the range of numbers indicated below expire during April 1983, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,243,822 to 3,248,737, inclusive

Plant Patents ..... Numbers 2,616 to 2,627 inclusive

REISSUES

OCTOBER 25, 1983

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,424
RESPIRATORS

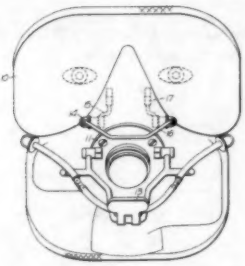
John Ernsting, Fleet, England; Thomas R. Morgan, Graniteville, S.C.; Leonard F. W. Palmer, Seaton, England; Alfred J. Rivers, Church Crookham, England, and Stephen M. Robson, High Wycombe, England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, by said Ernsting, Palmer, River, and Robson and The United States of America as represented by the Secretary of the Air Force, Washington, D.C., by said Morgan

Original No. 4,294,243, dated Oct. 13, 1981, Ser. No. 967,122, Dec. 8, 1978. Application for reissue Oct. 27, 1982, Ser. No. 437,766

Claims priority, application United Kingdom, Dec. 9, 1977, 51378/77

Int. Cl.[3] **A62B** *7/00*

U.S. Cl. 128—201.18 **8 Claims**



1. An oro-nasal respirator, comprising:

a. a visor;

b. a mask carried by said visor, said mask having a shape adapted to cover the nose and mouth of the wearer;

c. means for providing respiratory gas to the wearer through said mask;

d. means attached to said mask for selectively occluding the wearer's nose; said last mentioned means including a pair of spaced apart pivots penetrating through said mask in the nasal region thereof; yoke arms extending radially from said pivots on the inside of said mask; a handle secured to said pivots on the outside of said mask; said handle operable to rotate said pivots and cause said yoke arms to turn into the sides of the wearer's nose.

Re. 31,425
RESEALABLE CONTAINER

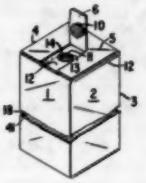
John J. Steinke, Whitehouse Station, and George Kaufman, North Brunswick, both of N.J., assignors to Church & Dwight Co., Inc., Piscataway, N.J.

Original No. 4,308,956, dated Jan. 5, 1982, Ser. No. 94,195, Nov. 14, 1979. Application for reissue Jul. 22, 1982, Ser. No. 400,865

Int. Cl.[3] **B43M** *7/00;* **B65D** *5/70, 5/72*

U.S. Cl. 206—611 **8 Claims**

8. A three-dimensional container with a square or rectangular cross-section comprising a top portion, a bottom portion and 4 side portions, the top portion being formed by a hinged flap of each side portion and adapted to lap one another, [the inner-most flap being provided with a centrally registered opening,] the second inner-most flap being provided with a centrally registered opening, the second outer-most flap being provided with a [centrally] registered die-cut piece secured to the outer-most flap and the outer-most flap being provided



with a hinged flap portion to open and close the container with the die-cut portion secured to the hinged flap.

Re. 31,426
INTRA-ORAL ALIGNING ASSEMBLY

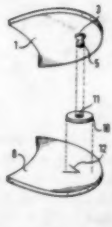
Karl Dalberl, Unterbergstrasse 4/II r., 8000 Münich, Fed. Rep. of Germany

Original No. 4,286,947, dated Sep. 1, 1981, Ser. No. 46,498, Jun. 7, 1979. Application for reissue Mar. 8, 1982, Ser. No. 356,161

Claims priority, application Fed. Rep. of Germany, Jun. 9, 1978, 2825470; Dec. 23, 1978, 2853828

Int. Cl.[3] **A61C** *19/04*

U.S. Cl. 433—72 **33 Claims**



1. An adjusting assembly for use in prosthodontics, occlusion diagnosis and/or occlusion therapy, comprising an upper jaw plate; a lower jaw plate, one of said plates being provided with an opening; and a pin having an externally threaded shaft partly received in one of the plates and having a free end adapted to be partly received in said opening, said free end being configurated as a spherical segment rigid with said shaft and having a spherical surface, said spherical surface being curved rearwardly from a point located on the longitudinal axis of the shaft through at least 100° of arc, said opening having a diameter being smaller than that of said spherical segment, the diameter and length of said opening as well as the diameter of said segment being so coordinated with one another that even at the largest degree of relative skewing to be expected of said bite plates a circumferential edge of said opening will abut said spherical surface along the entire length of said circumferential edge substantially without any freedom of play.

Re. 31,427
AROMA-ENRICHED COFFEE PRODUCTS AND PROCESS

Timothy A. Lubsen, Springfield; Rudolf G. K. Strobel, Colerain; Richard N. Reinhart, Springfield, and Jayantilal M. Patel, Reading, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Original No. 3,769,032, dated Oct. 30, 1973, Ser. No. 189,746, Oct. 15, 1971. Continuation of Ser. No. 967,045, Dec. 6, 1978, abandoned, which is a continuation-in-part of Ser. No. 156,555, Jun. 24, 1971, abandoned. Application for reissue Jan. 6, 1982, Ser. No. 337,226

Int. Cl.³ A23F *5/46*

U.S. Cl. 426—594 **36 Claims**

1. An aromatized instant coffee product having an intense roast and ground coffee aroma, said product comprising the combination of a structurally compatible instant coffee having a pore factor of at least [0.9] *0.94* and an aroma-enriched carrier, said product having an initial aroma intensity of at least [70,000] *165,000* gas chromatograph counts, *and an aroma retention factor of 1.0.*

Re. 31,428
FIRE PROTECTIVE TAPE

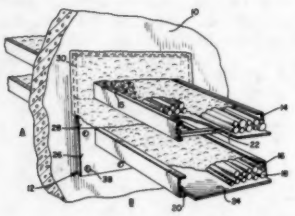
J. Watson Pedlow, Media, Pa., assignor to Thomas & Betts Corporation, Raritan, N.J.

Original No. 4,273,821, dated Jun. 16, 1981, Ser. No. 92,063, Nov. 6, 1979. Continuation-in-part of Ser. No. 872,820, Jan. 27, 1978, Pat. No. 4,189,619. Application for reissue Nov. 2, 1981, Ser. No. 317,699

The portion of the term of this patent subsequent to Feb. 19, 1997, has been disclaimed.

Int. Cl.³ B32B *7/00, 9/04, 5/16;* H02G *3/04*

U.S. Cl. 428—215 **11 Claims**



1. An electrical arc and fire protective tape for disposition about electrical equipment, cables, cable splices, appurtenant equipment or the like, comprising a resinous mixture coated as a wet mastic mixture and dried upon a fabric base or plastic sheet or film substrate, said mastic comprising an essentially halogen-free mixture of solids and thermoplastic binder resins dispersed as an emulsion in water, said solids including heat intumescing and expanding substances in approximate quantity of 4 to 25% to expand the mastic to porous heat insulating foam, ceramic frits in approximate quantity of 5 to 40% to provide a ceramic glaze upon the surface of the dry expanded mastic when exposed to high temperatures developed by fire, hydrated substances in approximate quantity of 10 to 40% and having bonded water evolvable only by application of sufficient heat to decompose and evolve water vapors, *fire protective solids of the character of antimony oxide and zinc borate in approximate quantity of about 2 to 15%,* and a resinous thermoplastic binder in approximate quantity of 5 to 40% to bind said solids to the form of a flexible film in coated form of the mastic, said binder being dispersed as an emulsion in water, there being sufficient water in the emulsion to convert said solids into a fluidized form for application as a coating upon said base or substrate, said percentages being by weight, the said soiids quantity being based on the total solids of the composition.

Re. 31,429
PROCESS FOR PREPARATION OF 9-(DIHALOBENZYL)ADENINES

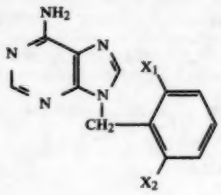
Robert Tull, deceased, late of Metuchen, N.J.; George D. Hartman, Lansdale, Pa., and Leonard M. Weinstock, Belle Mead, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Original No. 4,098,787, dated Jul. 4, 1978, Ser. No. 768,235, Feb. 14, 1977. Application for reissue Oct. 23, 1979, Ser. No. 87,603

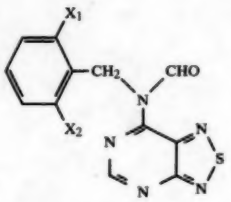
Int. Cl.³ C07D *473/34*

U.S. Cl. 544—277 **2 Claims**

1. The process for the preparation of compounds having the structure:



wherein X_1 and X_2 are independently halogen by reacting the compound having the structure:



wherein X_1 and X_2 are as defined above with Raney nickel in aqueous-alcohol solvent at about room temperature to about 125° C. for a period of about 1 hour to 24 hours.

Re. 31,430
CATALYSTS FOR THE HYDRATION OF NITRILES TO AMIDES

Clarence E. Habermann, and Ben A. Tefertiller, both of Midland, Mich., assignors to The Dow Chemical Co., Midland, Mich.

Original No. 3,631,104, dated Dec. 28, 1971, Ser. No. 835,765, Jun. 23, 1969. Continuation-in-part of Ser. No. 791,807, Jan. 16, 1969, Pat. No. 3,597,481. Application for reissue Feb. 26, 1981, Ser. No. 238,712

Int. Cl.³ C07C *103/00*

U.S. Cl. 564—127 **25 Claims**

1. In the process for converting a nitrile to the corresponding amide, the improvement comprising: reacting by contacting an [aliphatic nitrile] *olefinic nitrile of 3 to 6 carbon atoms* in the presence of water with a heterogeneous, cupreous catalyst consisting essentially of copper prepared by reducing copper oxide, copper oxide, copper-chromium oxide, copper-molybdenum oxide or mixtures thereof.

Re. 31,431

MOVABLE WIPER FOR POTENTIOMETERS

Ernst Gass, Stuttgart, Fed. Rep. of Germany, assignor to Novotechnik KG Offterdinger & Co., Ostfildern, Fed. Rep. of Germany

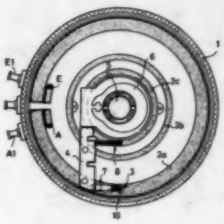
Original No. 4,237,443, dated Dec. 2, 1980, Ser. No. 50,190, Jun. 20, 1979. Continuation of Ser. No. 873,702, Jan. 30, 1978, abandoned. Application for reissue Jun. 11, 1982, Ser. No. 387,343

Claims priority, application Fed. Rep. of Germany, Feb. 17, 1977, 2706760

Int. Cl.³ H01C *10/50*

U.S. Cl. 338—202 10 Claims

1. In a wiper for high speed adjustable resistance, potentiometers and the like having a plurality of electrically conductive and flexible fingers which slidably engage a conductive surface along a given path and in which the fingers are arranged in parallel to each other with lateral separations therebetween and are carried by a relatively rigid support and having each a flexible length which extends outwardly from said support and in engagement with said conductive surface, the improvement comprising a common covering of yieldable elastomeric material extending over portions of said flexible lengths of said parallel fingers extending outwardly from said support and over portions of said lateral separations between said length portions to form a continuous covering over said length and separation portions, said elastomeric material having a high degree of internal friction and practically no elasticity thereby



exerting a high dampening force on a possible oscillating movement of each of said fingers, the contact area of the wiper with said conductive surface being free of said elastomeric material.

PLANT PATENTS

GRANTED OCTOBER 25, 1983

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,125

IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Mar. 2, 1982, Ser. No. 353,922
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of impatiens plant known by the cultivar name Milkyway, as described and illustrated, and particularly characterized as to uniqueness by its white flowers, variegated foliage, superior self-branching habit, tightly compact and symmetrically mounded growth habit, high floriferousness, and by its relative deterioration under low temperatures.

5,126

IMPATIENS PLANT

James C. Mikkelsen, Ashtabula, Ohio, assignor to Mikkelsens, Inc., Ashtabula, Ohio

Filed Mar. 2, 1982, Ser. No. 354,077
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—68 1 Claim

1. A new and distinct cultivar of impatiens plant known by the cultivar name Columbia, as described and illustrated, and particularly characterized by its excellent keeping qualities; generally light pink flower color; firm, thick and non-fragile flower petal texture; relatively slow growth and compact, tight habit; early flowering response; dark green foliage which provides a pleasant contrast with flower color; performs best under full sunlight, and its adaptability to different environments of use, including use initially as house plant which can later be transferred to the garden.

5,127

CHRYSANTHEMUM PLANT

William E. Duffett, Salinas, Calif., assignor to Yoder Brothers, Inc., Barberton, Ohio

Filed Mar. 1, 1982, Ser. No. 353,021
Int. Cl.[3] A01H *5/00*
U.S. Cl. Plt.—78 1 Claim

1. A new and distinct cultivar of *Chrysanthemum morifolium,* Ramat., plant known by the cultivar name of Sequest, as described and illustrated, and particularly characterized as to uniqueness by the combined characteristics of flat capitulum form; decorative capitulum type; dark yellow ray floret color; diameter across face of capitulum ranging from 85 to 110 mm. at maturity; uniform 10 week flowering response; medium plant height; spreading branching pattern; and being photosynthetically efficient, producing strong plants under low, winter light regimes with 14 to 16 hour continuous dark periods.

5,128

NEPHROLEPIS EXALTATA— ELEANOR CULTIVAR

G. Jack Hofland, Jordan Station, Canada, assignor to Jordan Station Wholesale Florist Limited, Jordan Station, Canada

Filed Jun. 16, 1982, Ser. No. 389,057
Int. Cl.[3] A01H *9/00*
U.S. Cl. Plt.—88 1 Claim

1. A new and distinct variety of *Nephrolepis exaltata* which is believed to be a whole plant mutation of the Curly Boston variety, substantially as herein illustrated and described, characterized by (a) a faster growth habit than the Curly Boston variety, (b) a mature 1-pinnate frond configuration which tends to be more oblong than that of the Curly Boston variety wherein the frond configuration is more tapered, (c) considerably more pronounced serrations on the pinnae margins than the Curly Boston variety, (d) larger pinnae than the Curly Boston variety, (e) when fully developed fewer pinnae per frond than the Curly Boston variety, (f) pinnae which tend to be slightly diagonally disposed along the midrib of the frond while the pinnae of the Curly Boston variety tend to be disposed at substantially right angles to the midrib of the frond, and (g) when fully developed bears fewer fronds per plant than the Curly Boston variety.

PATENTS

GRANTED OCT. 25, 1983

ERRATA

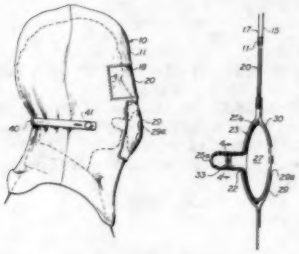
For CLASS	See PATENT NO.
502–035	4,411,818
502–167	4,411,820
502–117	4,411,821
502–168	4,411,822
502–168	4,411,823
502–323	4,411,824
525–315	4,412,061
381–060	4,412,096
381–092	4,412,097
381–043	4,412,098
381–051	4,412,099
381–100	4,412,100

PATENTS

GRANTED OCTOBER 25, 1983

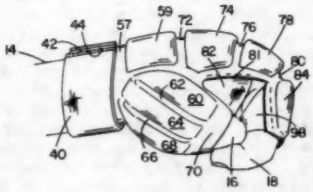
GENERAL AND MECHANICAL

4,411,023
SMOKE PROTECTIVE HOOD
Jay D. Pinson, 6520 Kingland Ct., San Jose, Calif. 95120
Filed Oct. 13, 1981, Ser. No. 310,651
Int. Cl.³ A42B *1/04*; A62B *23/00*
U.S. Cl. 2—7 **18 Claims**



7. A protective hood comprising a front wall, a rear wall having a configuration similar to the configuration of said front wall, means for securing said walls together along the top and side edges, each of said walls being multi-layered and including an outer layer of flexible, fire-retardant, non-combustible, heat-reflective material and an inner insulating layer of polyester cloth, means defining a first and second aperture in said front wall, a transparent non-flammable eyepiece mounted in said first aperture, a respirator secured in said second aperture, and a respirator-positioning member with a mouth gripping member mounted in said front wall adjacent said respirator.

4,411,024
PROTECTIVE GLOVE
J. Brian Hayes, Walhalla, S.C., assignor to The Kendall Company, Walpole, Mass.
Filed Dec. 29, 1980, Ser. No. 220,503
Int. Cl.³ A41D *13/08*
U.S. Cl. 2—20 **15 Claims**



1. A contact sport protective glove adapted to cover the back of the hand including at least a portion of the metacarpus, the knuckles between the metacarpus and the fingers, and at least a portion of each of the thumb and four fingers, comprising

a flexible member having a tough outer protective membrane and a smooth hand-contacting, inner membrane connected together around the peripheral edge of said member, said outer membrane having a plurality of discrete foam-filled, protective protrusions spaced from one another by thin areas providing bending of said member thereat,

said thin areas including

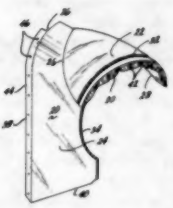
a plurality of transversely extending metacarpus areas extending between the opposite peripheral edges of said member, said metacarpus areas being longitudinally spaced from one another and defining at least one transversely extending metacarpus-protective protrusion therebetween,

a generally longitudinally extending area intermediate the portion of said glove adapted to cover said metacarpus and the portion of said glove adapted to cover said thumb portion,

a plurality of obliquely extending thumb areas connected at their proximal ends adjacent said longitudinal area and defining at least one thumb-protective protrusion therebetween, and

a plurality of finger areas, connected at their proximal ends adjacent the distal one of said metacarpus areas and at their distal ends being adjacent said peripheral edge, said finger areas being spaced from and generally parallel to one another and defining at least one finger-protective protrusion therebetween.

4,411,025
COMBINED CHEST PIECE AND SHOULDER PAD
Mark Magidson, Los Angeles, Calif., assignor to Moldex/Metric Products, Inc., Culver City, Calif.
Filed Dec. 22, 1982, Ser. No. 452,217
Int. Cl.³ A41D *1/00*, *27/26*, *27/02*
U.S. Cl. 2—97 **14 Claims**



1. A combined chest piece and shoulder pad, comprising

an integral unitary structure formed of molded non-woven fiber material including

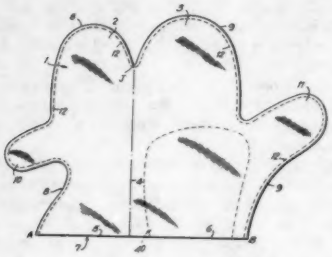
a chest piece portion having a shape to form a foundation for the chest area of a jacket and with the chest piece portion having a central area surrounded by peripheral edge portions and with the peripheral edge portions more tightly compacted than the central area to provide for a tapering between the central area and the peripheral edge portions and with the central area compacted sufficiently to provide for a firm support of the jacket in the chest area, and

a shoulder pad portion having a shape to form a foundation for the shoulder portion of the jacket and with the shoulder pad portion having an inner edge and an outer edge and with a portion of the inner edge contiguous with a peripheral edge portion of the chest piece portion and with the inner edge more tightly compacted than the remaining portion of the shoulder pad portion and with the remaining portion of the shoulder pad portion tapering from the more tightly compacted inner edge to the outer edge which is less tightly compacted than the chest piece portion to form a lightly compacted shoulder pad to provide for a soft resilient support of the jacket in the shoulder area.

4,411,026
HAND COVERING

Michael Secter, c/o Robert Engel, P.O. Box 2421, Santa Fe, N. Mex. 87501

Filed Jun. 24, 1981, Ser. No. 277,056
Int. Cl.[3] A41D 00/00, 19/02, 19/00
U.S. Cl. 2—158 8 Claims



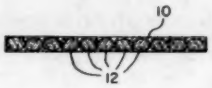
1. A hand covering comprising a blank of material including front and back portions having respective bases and perimetral edges extending from said bases, said front and back portions being folded into overlying relation along a fold line serving as a common juncture and secured together along said perimetral edges to form an enclosure in which said bases form an open edge and the front and back portions lie in a plane, said front and back portions prior to folding thereof including respective radially projecting portions extending laterally from each of said front and back portions, said projecting portion from said front portion extending in a direction inclined to said fold line at a slight downwards angle towards said base of said front portion while said projecting portion from said back portion extends in a direction inclined to said fold line at a slight upwards angle away from said base of said back portion, said projecting portion from said rear portion being of larger size than said projecting portion from said front portion, said projecting portions being respectively of smaller size than their respective front and rear portions, said perimetral edges of said front and back portions including line segments joining said bases with said projecting portions smoothly and without discontinuity, said line segments being inclined in the same direction at acute angles with respect to said bases, such that when said portions are folded and secured together along the perimetral edges thereof and thereafter folded inside-out hollow thumb covering is formed which lies at an angle across said enclosure and is flexed to project from the plane of the front and back portions when a hand of a user is inserted into said enclosure.

4,411,027
BIO-ABSORBABLE COMPOSITE TISSUE SCAFFOLD

Harold Alexander, Short Hills; John R. Parsons, Montclair; Irving D. Strauchler, Irvington, and Andrew B. Weiss, Short Hills, all of N.J., assignors to University of Medicine and Dentistry of New Jersey, Newark, N.J.

Continuation of Ser. No. 33,945, Apr. 27, 1979, Pat. No. 4,329,743. This application Feb. 23, 1982, Ser. No. 351,454
The portion of the term of this patent subsequent to May 18, 1999, has been disclaimed.
Int. Cl.[3] A61F 1/00
U.S. Cl. 3—1 17 Claims

1. A bio-compatible composition suitable for fabricating a non-migratory surgical article for the repair or replacement of ligament or tendon fibrous tissue of a human or non-human animal comprising a substrate of a plurality of carbon fibers completely enveloped by a bio-absorbable and bio-compatible polymer wherein the longitudinal axes of said carbon fibers are oriented in substantially the same direction and wherein said fibers provide a scaffold which promotes the growth of new

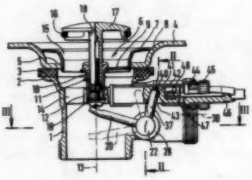


fibrous tissue which is oriented substantially parallel to the longitudinal axes of said carbon fibers.

4,411,028
DEVICE FOR ACTUATING A POPPET OF A TUB DRAIN VALVE

Johannes Högner, Schiltach, Fed. Rep. of Germany, assignor to Firma Hans Grohe GmbH & Co. KG, Fed. Rep. of Germany

Filed Mar. 12, 1982, Ser. No. 357,717
Claims priority, application Fed. Rep. of Germany, Mar. 16, 1981, 3110151
Int. Cl.[3] E03C 1/24
U.S. Cl. 4—199 9 Claims



1. An apparatus for operating a poppet valve which is mounted in a tub drain for upward and downward movement in a vertical drainpipe portion which also has a laterally extending horizontal tubular drain pipe portion, comprising a guide tube extending radially of the poppet valve, a control slide slidable in said guide tube and gaving a remote end remote from the poppet valve adapted to be connected to a remote control, a bearing cylinder extending into the horizontal tubular drain portion, a lever assembly connected between said control slide and said poppet valve including a journal pin portion rotatably mounted in said bearing cylinder, a first lever arm portion having one end connected to said pin portion and an opposite end connected to said control slide, and a second lever arm portion extending radially into the norizontal tub drain portion and being bent at its outer end so that it extends axially of the horizontal drain portion and radially of the vertical portion to a position at its outer end at a location below and in contact with the poppet valve, displacement of said slide causing movement of said first lever arm portion, rotation of said journal pin portion and shifting of the outer end of said second lever arm portion selectively upwardly or downwardly.

4,411,029
CONTROL DEVICE FOR THE WATER TANK OF A FLUSH TOILET

Jiunn-Cherng Huang, Taipei Hsien, Taiwan, assignor to Sin Sui Lai, Taiwan

Filed Dec. 14, 1981, Ser. No. 330,436
Int. Cl.[3] E03D 1/34, 1/14, 3/12
U.S. Cl. 4—324 4 Claims

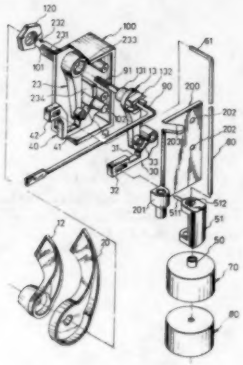
1. A two-level controlling device for the water-tank of a flush toilet comprising:

a housing having a threaded tube mounted to the water-tank;

at least one crank means extending through the housing to outside of the tank and embedded with a handle means;

a pulling rod means having its short arm caught into the rear of said at least one crank means and the front end of said short arm extending through shaft tube of said crank means and the housing to the outside of the tank and embedded with a handle means, and the long arm of said rod means connecting to a falling water head through a flexible member;

at least one cradle means provided inside said housing, and being kept in a position of engaging with a lower end of said crank means;



a connecting means having its upper portion movably connected to the outer end of said cradle means;

a floating means being movably connected to the lower portion of said connecting means; and when said handle means being pressed, rendering said crank means, said rod means and said cradle means to rotate a certain angle counter-clockwise, the floating means moving upward; said falling water head is thus opened to start flushing, until the flotation force of said floating means is lost.

4,411,030

APPARATUS FOR DRYING GENITALS AND THE POSTERIOR PARTS OF HUMAN BODY

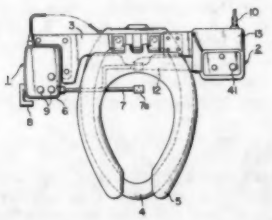
Shinji Kawai, Toyota; Koichi Suzuki, Chiryu, and Yuji Yamaguchi, Anjo, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Oct. 14, 1981, Ser. No. 311,476

Claims priority, application Japan, Oct. 16, 1980, 55-147713[U]; Oct. 25, 1980, 55-152806[U]

Int. Cl.³ A61H *35/00*; A47K *3/22*

U.S. Cl. 4—443 **10 Claims**



1. An apparatus for drying genitals and the posterior parts of a human body after bathing by a bidet device comprising:

a fan to blow air for drying genitals and the posterior parts provided with electric motor means for rotating the fan,

heater means for heating the air,

said heater means comprising at least two heater elements, and control circuit means comprising a thermostat connected in series with one of said heater elements to cut off the electric power supply to said one of the heater elements in the heater means when the temperature of the blown air exceeds a predetermined value while still energizing the other of said heater elements.

4,411,031

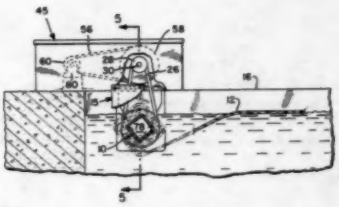
BUOYANT SWIMMING POOL COVER

Mike Stolar, Oakville, Canada, assignor to Stolar Pool Covers Ltd., Hamilton, Canada

Continuation of Ser. No. 211,234, Nov. 28, 1980. This application Nov. 30, 1981, Ser. No. 326,066

Int. Cl.³ E04H *3/16, 3/18*

U.S. Cl. 4—502 **22 Claims**



1. A swimming pool cover assembly for a swimming pool having an adjacent wall and a remote wall, the cover assembly comprising a roller rotatable about a substantially horizontal axis, a flexible buoyant blanket attached at one end of said roller and wound on said roller in a direction so that the end thereof remote from said attached end extends toward said remote wall of the swimming pool from beneath said roller, support means to support said roller in a generally horizontal disposition with at least a portion thereof below the intended level of water in a pool, and drive means to rotate said roller about said horizontal axis in a direction to cause said blanket to be drawn below the intended level of water and onto said roller at a location below said horizontal axis and to rotate said roller in the opposite direction to unwind said blanket at a speed such as to permit deployment of said blanket by virtue of the buoyancy thereof.

4,411,032

NECK REST FOR SHAMPOO BOWLS

Laury P. Lewy, 1310 Ashland, Wilmette, Ill. 60091

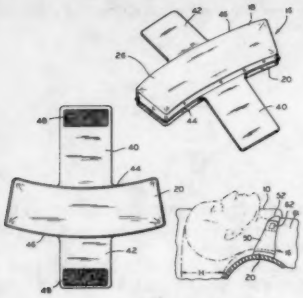
Continuation-in-part of Ser. No. 229,459, Jan. 29, 1981, abandoned. This application Feb. 2, 1982, Ser. No. 344,921

Int. Cl.³ A54D *44/10, 19/00*

U.S. Cl. 4—523 **13 Claims**

1. A neck rest to be secured around a person's neck and to fit different sized and shaped shampoo bowls, said neck rest comprising a body of flexible elastomeric material having an upper and lower surface; a compartment formed between the upper and lower surfaces filled with a padding material; a pair of elongated tab members extending outwardly from opposite ends of the body shaped to fit around a person's neck; and

means disposed on said tab members to adjustably and removably secure said tabs together at any desired length around a person's neck, whereby said tabs may be adjusted to fit snugly around different sized necks.



4,411,033

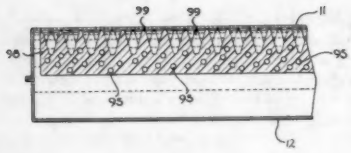
WAVELESS WATERBED

Charles W. Morgan, Rolling Hills, Calif., assignor to United Foam Corporation, Lynwood, Calif.

Continuation-in-part of Ser. No. 59,783, Jul. 23, 1979, abandoned. This application Sep. 26, 1980, Ser. No. 191,169

Int. Cl.³ A47C *27/08*

U.S. Cl. 5—450 **30 Claims**



1. A body supporting container capable of being filled with a liquid, said container having a substantially open celled foam disposed therein, said foam extending substantially along the horizontal dimensions of said container and occupying 20 to 80 percent of the depth of the container when said container is filled, said foam having a material of low specific gravity disposed throughout its body, said material of low specific gravity causing the foam to float in the liquid, above the bottom wall of the container, close to the top wall of the container, whereby wave motion in said filled container is dampened while the desirable qualities of the liquid-filled body supporting container are retained.

4,411,034

BLANKET DEVICE WITH ALARM

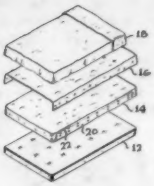
Althea M. W. Williams, 2097 W. 30th St., Los Angeles, Calif. 90018

Filed May 13, 1981, Ser. No. 263,265

Int. Cl.³ A47G *9/02*

U.S. Cl. 5—494 **9 Claims**

1. An apparatus of the class described comprising a mattress and a blanket, a first group of electrically conductive snaps mounted on the blanket, a second group of electrically conductive snaps mounted in generally fixed relationship to said mattress, said first group of snaps adapted to mate with said second group of snaps, an alarm system connected to said snaps in such a way that an alarm sounds when any of the mating snaps separate, and a thrashing movement adjustment means connected to said snaps to prevent said snaps from separating until said blanket is moved a predetermined distance from its position on the bed.



4,411,035

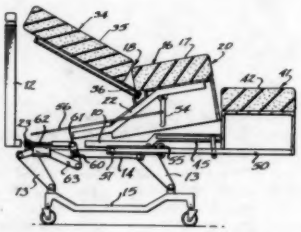
MATERNITY CARE BED

Loel Fenwick, S. 161 Adams, Spokane, Wash. 99201

Filed Mar. 30, 1981, Ser. No. 248,701

Int. Cl.³ A61G *7/00*

U.S. Cl. 5—68 **10 Claims**



1. A combination labor, delivery and patient care bed, comprising:

a seat section elevationally movable relative to the floor between a lowered position and a raised position;

a foot section elevationally movable independently of the seat section for movement between raised and lowered positions outward from the seat section, and longitudinally movable to a position beneath the seat section;

and common framework means supporting said seat section and foot section independently of one another for relative movement of either with respect to the other.

4,411,036

TRANSPORTABLE BRIDGE

James P. Fitzgerald-Smith, Ossemsley, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Nov. 16, 1981, Ser. No. 321,511

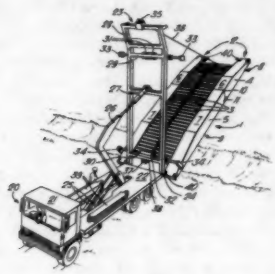
Claims priority, application United Kingdom, Nov. 27, 1980, 8038076

Int. Cl.³ E01D *15/12, 15/14*

U.S. Cl. 14—2.4 **7 Claims**

6. A transportable bridge including two substantially parallel trackway girders each having a decking face, a ground opposable face, a home bank end and a far bank end; said girders being leterally spaced apart by a multiplicity of articulated decking members each pivotally attached adjacent its two ends to the two girders respectively so as to be foldable in a direction permitting variation of the lateral separation of the two girders; said transportable bridge further comprising a transporter/launcher vehicle having a cab and a chassis, said vehicle including a launch frame having a hinged end connection to the rear end of the chassis, jacking means for tilting the launch

frame upwards from the chassis about the hinged end connection to a substantially vertical position, pivotal engagement means attached to the launch frame adjacent the hinged end connection engageable with the home bank ends of both girders when the bridge is located for transit upon the launch frame in an inverted position, adjustment means attached to the launch frame for varying the lateral separation of the two



girders, said adjustment means comprising at least one pair of opposed hydraulic jacks attached to the launch frame and respectively operative upon the two girders, and far bank end winching means operative between the launch frame and the far bank ends of the two girders for raising and lowering the bridge about the pivotal engagement means when the launch frame has been tilted to the substantially vertical position by the jacking means.

4,411,037

AUTOMATIC DEVICE FOR LAP JOINT CONNECTION ON THE INTRADOS OR EXTRADOS OF TWO BRIDGE ELEMENTS AND METHOD FOR THE CARRYING OUT THEREOF

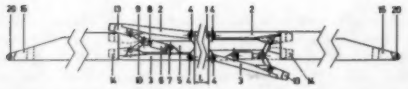
Michel E. Terrien, and Claude Bouvet, both of Angers, France, assignors to Etat Francais, Paris, France

Filed Aug. 10, 1981, Ser. No. 291,452

Claims priority, application France, Jul. 28, 1980, 80 18255

Int. Cl.³ E01D *15/14, 15/12*

U.S. Cl. 14—2.6 **16 Claims**



1. A device for permitting the lap joint connection of two bridge elements, said bridge elements being positionally interchangeable, ends of each bridge element comprising:

a first flap hinged on the extrados of the bridge element;

a second flap hinged on the intrados of the bridge element; and

a means for the combined displacement in opposite directions of the first and second flaps; and

means for locking at least one flap to its respective bridge element and means for locking at least one other flap to the other bridge element.

4,411,038

PNEUMATIC CLEANING SYSTEM

Shinichi Mukai, 2411 22nd Ave., Kingsburg, Calif. 93631

Filed Nov. 16, 1981, Ser. No. 321,682

Int. Cl.³ A23N *12/00*

U.S. Cl. 15—3.13 **15 Claims**

14. A pneumatic cleaning system for particulate bulk material including debris and desired particles, the system comprising

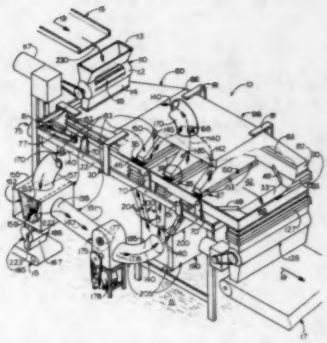
A. a substantially air-tight enclosure,

B. a pan extending horizontally across the enclosure and having a perforate section,

C. first air lock means disposed at one side of the perforate section for depositing such material from the exterior of the enclosure onto the pan in a layer,

D. second air lock means disposed at the other side of the perforate section for removing the desired particles to the exterior of the enclosure,

E. means for reciprocating the pan horizontally in a direc-



tion between said sides so that the layer is motivated across the perforate section in an agitated condition from the one side toward the other side,

F. an outlet duct disposed to direct a stream of air upwardly through the perforate section and the layer thereat,

G. an inlet duct having an opening generally aligned with the perforate section and disposed in closely adjacent, upwardly spaced relation to the layer, and

H. blower means for supplying such stream of air to the outlet duct to urge the debris upwardly from the desired particles in the layer and for providing a vacuum at the inlet duct to draw the upwardly urged debris from the layer.

4,411,039

REMOVAL OF CONDENSED GAS FROM THE WALLS OF GAS PIPELINES

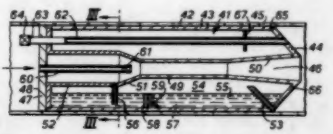
Cyril Timmins, and John J. Templeman, both of Solihull, England, assignors to British Gas Corporation, England

Filed Dec. 9, 1981, Ser. No. 329,064

Claims priority, application United Kingdom, Dec. 9, 1980, 8039347

Int. Cl.³ B08B *9/04*

U.S. Cl. 15—104.06 R **17 Claims**



1. A pig for passage through a gas pipeline for removing condensed gas from the wall of the pipeline and for revaporizing the gas or entraining mist or droplets in the gas flow through the pipeline, said pig comprising a body which fits in and is driven along the pipeline by differential pressure between the front and back of the pig, a flow gas duct located

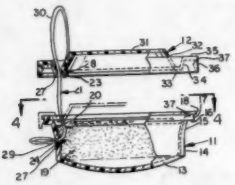
within the body of the pig and extending longitudinally thereof for receiving flow gas from the pipeline and including an outlet for discharging the flow gas in the pipeline ahead of the pig, the flow gas duct having a venturi so that the condensed gas is entrained into the flow gas duct in the gaseous or dense phase or in the form of mist or droplets for discharge in the pipeline ahead of the pig, flow gas inlet means, extending inwardly from the back end of the body and opening into said flow gas duct, for accelerating gas flowing thereinto from the pipeline for discharge into the flow gas duct, condensed gas inlet means extending into the body of the pig and arranged to collect gas which has condensed in the pipeline and condensed gas outlet means arranged to receive the collected gas and discharge the collected gas into the flow gas duct.

4,411,040

POCKET GOLF BALL WASHER

Robert F. Sharrow, 224 Longacre Ave., and Sidney L. Sherman, 5956 Jodie La., both of Erie, Pa. 16509

Filed Mar. 19, 1981, Ser. No. 245,523
Int. Cl.³ A63B *47/04*
U.S. Cl. 15—104.94 **1 Claim**



1. In combination a golf ball cleaner (10) having a container (11), a cover (12), a cylindrical sponge (19), and a cord (21) adapted to be carried in the pocket of a golfer comprising,

said container (11) being generally cylindrical and cup-shaped and made of relatively rigid material,

a generally cup-shaped cover (12), and

said cylindrical sponge (19) received in said cup-shaped container, said sponge being flexible and fitting into said container and being adapted to be engaged by said cover, said container comprising,

a convex bottom (13) providing a reservoir for fluid below said sponge and extending upwardly therefrom to engage said cover,

a cylindrical side wall (14), integrally attached to said bottom and extending upwardly therefrom,

and an upwardly and outwardly extending frusto conical shaped side wall (15) integrally attached to said cylindricl side wall and extending upardly and outwardly therefrom providing a space of said sponge to expand into when said cover is closed,

a flat annular outwardly extending shoulder (16) attached to said upwardly and outwardly extending side wall (15),

an upwardly extending cylindrical rim (17) integrally attached to the outer periphery of said shoulder (16) and an outwardly extending flange head (18) integrally attached to said cylindrical rim (17),

said cover (12) being made of relatively rigid material and comprising an annular downwardly and outwardly inclined side wall (32) and a flat top (31) integrally attached to said downwardly and outwardly extending side wall (32) providing additional rigidity to said cover,

an outwardly extending rim (33) integrally attached to said downwardly and outwardly inclined side wall (32) and adapted to engage said sponge pushing said sponge downwardly preventing said sponge from interfering with closing of said cover and pushing against said body to prevent said cover from popping off said case,

and an upwardly and outwardly extending wall (34) integrally attached to said rim (33),

a cylindrical flange (35) integrally attached to said upwardly and outwardly extending wall (34),

and a cylindrical flange (36) integrally attached to said cylindrical flange (35) and extending downwardly therefrom,

and a flange head (37) integrally attached to the inner periphery of said cylindrical flange (36) and spaced downwardly from said cylindrical flange (35) and adapted to underlie a rib on said upwardly extending rib,

said cover (12) being adapted to be received in said container (11) with said outwardly and upwardly extending wall (32) of said cover resting on said upwardly and outwardly extending wall (15) of said container, said cylindrical flange (35) resting on said flange head (18) of said container and cylindrical flange (35) of said cover providing a seal therebetween and said cylindrical flange (35) overlying said flange head of said container and said flange head urging said cover toward said container thereby urging said inclined surface on said cover into engagement with said inclined surface (15) on said container and urging said cylindrical flange (35) into engagement with said sponge,

a cord extending through a first opening in said container and through a second opening in said container, then through a third opening in said cover and through a fourth opening in said cover and means on the ends of said cord to prevent said cord from being withdrawn,

said cord being substantially longer than the space between said openings whereby substantial loops are provided, a cover loop to receive the finger of an operator for holding said cleaner when said container is closed and a container to receive a towel and said cover may be removed a substantial distance from said container when said cover is opened.

4,411,041

SILVER-PLATED TOOTH BRUSH

Renato Braga, Via Ozanam, 4, Milano, Italy

Filed Mar. 3, 1981, Ser. No. 241,461
Claims priority, application Italy, Dec. 4, 1980, 26430 A/80
Int. Cl.³ A46B *9/04*
U.S. Cl. 15—167 R **1 Claim**

1. A toothbrush comprising a handle and a head having a surface and fitted with bristles, at least that part of the head's surface which carries the bristles being coated with silver whose bactericidal properties, when contacted with water, are transferred by the water to the bristles by the ions of silver possessed within the silver, wherein the silver coating is applied before insertion of the bristles, said coating being also applied to the sides of the holes in which the tufts of the bristles are fitted to provide a sterilization action on the bristles and within the spaces among the base of the bristles, and between the sides of said holes and the bristles in such a way as to avoid proliferation of bacteria on the bristles from their base portions to the tips thereof.

4,411,042

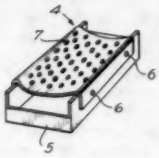
CLEANING DEVICE

Toshio Sakata, and Takeji Morikawa, both of Toyokawa, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 21, 1981, Ser. No. 332,995
Claims priority, application Japan, Dec. 25, 1980, 55-186307
Int. Cl.³ G03G *21/00*
U.S. Cl. 15—256.51 **10 Claims**

1. A cleaning device for removing toner from the surface of a moving member, said cleaning device including a cleaning member in pressing contact with the surface of the moving

member and formed with a plurality of perforations in the area where the cleaning member is in contact with said surface to



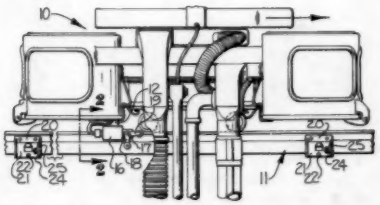
remove the toner by the edge portions defining said perforations.

4,411,043

TRAVELING PNEUMATIC CLEANER WITH REVERSING ARRANGEMENT

William L. Mulligan, Charlotte, N.C., assignor to Parks-Cramer Company, Charlotte, N.C.

Filed Apr. 2, 1982, Ser. No. 364,967
Int. Cl.³ A47L 5/14
U.S. Cl. 15—312 R **6 Claims**



2. Apparatus for cleaning textile mill rooms and comprising:

track way means for extending over a plurality of textile machines;

traveling pneumatic cleaner means supported on said track way means for movement in forward and reverse directions thereon, said traveling pneumatic cleaner means having tractor drive motor means for driving said cleaner means in movement along said track way,

reversing trip means mounted on said track way means at at least one predetermined location therealong for signaling at least one location at which a reversal in the direction of movement of said traveling pneumatic cleaner means along said track way means is to occur,

switch means mounted on said traveling cleaner means for engagement with said trip means during forward and rearward movement of said traveling cleaner along said track way means and relative to said trip means, said switch means being operable upon engagement with a trip means to change between a first state signaling that the traveling cleaner means should move forwardly and a second state indicating that the traveling cleaner should move rearwardly, and

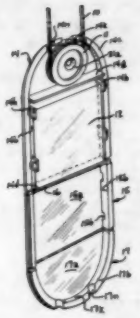
control circuit means operatively interconnecting said switch means and said tractor drive motor means and responsive to a change in state of said switch means for interrupting the delivery of electric power to said tractor drive motor means and after a predetermined short interval of delay energizing the tractor drive motor means to drive the traveling cleaner in an opposite direction.

4,411,044

CORD WEIGHT PULLEY

Boris Volfson, Middleton, Wis., assignor to Graber Industries, Inc., Middleton, Wis.

Filed Jan. 22, 1982, Ser. No. 341,858
Int. Cl.³ A47H 11/06; E05D 17/00
U.S. Cl. 16—219 **8 Claims**



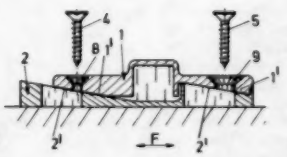
1. A cord weight pulley assembly for traverse rod installations comprising, a one-piece housing formed of synthetic resin material and including a first housing section having a lower weight receiving cavity and an upper pulley receiving cavity at an inner side thereof, a second housing section integrally connected along one edge by a first flexible hinge portion to one edge of the first housing section and adapted to be flexed along the first hinge portion relative to the first housing section to a closed position in overlying relation to said weight receiving cavity, and a third housing section integrally connected at one edge by a second flexible hinge portion to a second edge of the second housing section and adapted to be flexed along the second flexible hinge portion relative to the second housing section, when the latter is in its closed position, into and out of a closed position in overlying relation to the pulley receiving cavity in the first housing section, cord guide pulley means in said pulley receiving cavity, weight means in said weight receiving cavity, and means for retaining said second housing section in its closed position on said first housing section.

4,411,045

HINGE

Erich Röck, Höchst, and Klaus Brüstle, Lauterach, both of Austria, assignors to Julius Blum Gesellschaft m.b.H., Höchst, Austria

Filed Oct. 22, 1981, Ser. No. 313,976
Claims priority, application Austria, Nov. 14, 1980, 5604/80
Int. Cl.³ E05D 7/04
U.S. Cl. 16—243 **7 Claims**



1. In a hinge for pivotally mounting a door onto a body of an article of furniture, said hinge being of the type including a hinge casing adapted to be fastened to a door of an article of furniture, a mounting member adapted to be fastened to a body of the article of furniture, and at least one hinge link and at least

one hinge axle connecting said hinge casing and said mounting member, the improvement comprising:

an intermediate member positionable between said mounting member and the body for adjusting the relative spacing therebetween;

said mounting member having therethrough a round hole and having a central length portion and two opposite end length portions;

said central length portion supporting said hinge axle to extend in a longitudinal direction;

said mounting member having at said two opposite end length portions two inclined wedge faces extending parallel to said longitudinal direction of said hinge axle;

said intermediate member having two inclined wedge faces extending parallel to said longitudinal direction of said hinge axle and in contact with respective said inclined wedge faces of said mounting member, such that displacement of said intermediate member with respect to said mounting member in opposite directions parallel to said longitudinal direction will change the relative spacing of said mounting member from the body;

a screw extending through said round hole and through said intermediate member; and

said intermediate member having therethrough a slot elongated in a direction parallel to said longitudinal direction of said hinge axle, said screw extending through said slot, thereby enabling said displacement of said intermediate member with respect to said mounting member.

4,411,046

MULTI-PINTLE HINGE WITH RACK AND PINION SLIDE

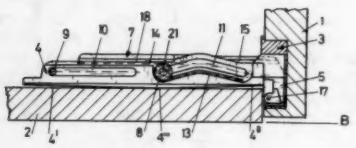
Peter Nawrath, Remscheid, Fed. Rep. of Germany, assignor to Julius Blum Gesellschaft m.b.H, Höchst, Austria

Filed Jan. 14, 1981, Ser. No. 224,923

Claims priority, application Austria, Jan. 15, 1980, A182/80.

Int. Cl.³ E05D *15/08*

U.S. Cl. 16—354 **14 Claims**



1. A furniture hinge having an opening angle of approximately 180°, said hinge comprising:

a base plate adapted to be fastened to a wall of an article of furniture;

a hinge casing adapted to be fastened to a furniture door;

a first hinge arm pivotally connected to said hinge casing and mounted for sliding movement with respect to said base plate;

a slide member;

means mounting said slide member on said first hinge arm for sliding movement in a longitudinal direction with respect thereto;

a second hinge arm having a first end pivotally connected to said hinge casing and a second end pivotally connected to said slide member;

whereby pivoting movement of said hinge casing with respect to said base plate causes said second hinge arm to move said slide member longitudinally with respect to said first hinge arm;

a first rack on said slide member;

a second rack fixed with respect to said base plate;

gear wheel means, mounted on said first hinge arm and in meshing engagement with said first and second racks, for, in resonse to sliding movement of said slide member longitudinally with respect to said first hinge arm, causing said first hinge arm to slide with respect to said base plate; and

means for connecting said first hinge arm and said base plate and for guiding sliding movement of said first hinge arm with respect to said base plate, said connecting and guiding means comprising a first slide way portion fixed with respect to said base plate at an outer position relatively adjacent said hinge casing, a second slide way portion fixed with respect to said base plate at an inner position relatively spaced from said hinge casing, and engaging means on said first hinge arm extending into said first and second slide way portions for causing said sliding movement of said first hinge arm to follow the contour of said slide way portions, said first slide way portion having a curved contour such that upon opening or closing movement of said hinge casing with respect to said base plate, said first hinge arm, said slide member, said second hinge arm and said hinge casing are moved in a direction away from and generally normal to the mounting plane of said base plate.

4,411,047

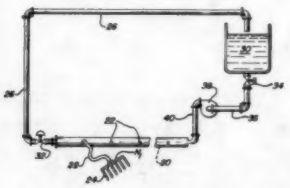
LIQUID DELIVERY SYSTEM

William W. Norton, Lincolnshire, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Feb. 21, 1979, Ser. No. 13,512

Int. Cl.³ A22C *9/00*

U.S. Cl. 17—51 **14 Claims**



1. A system for the delivery of liquid in predetermined amounts through a plurality of relatively small valved conduits, which comprises:

a relatively large elongated manifold chamber forming member, said chamber forming member communicating with each of said relatively small conduits; a source of liquid for delivery; conduit means providing flow communication between said source of liquid and said manifold chamber forming member, and centrifugal pump means positioned to continuously pump liquid from said source of liquid to said manifold chamber forming member, said centrifugal pump means being of a capacity sufficient to create and maintain a generally constant liquid pressure in said manifold chamber forming member irrespective of whether any or all of said relatively small conduits are open to permit liquid flow therethrough.

4,411,048

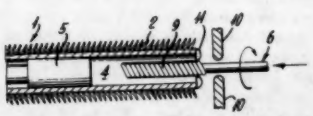
END CLOSURE FOR SAUSAGE CASINGS

Edward A. T. Green, Denny, England, assignor to Devro, Inc., Somerville, N.J.

Filed May 4, 1981, Ser. No. 260,506

Int. Cl.³ A22C *13/00, 11/12*

U.S. Cl. 17—49 **3 Claims**



3. A method of end-closing a strand of sausage casing comprising clamping the strand to prevent the strand from rotating

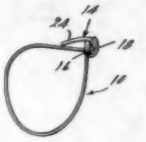
about its longitudinal axis, twisting an end portion of said strand into a cord axially extending beyond the end of the strand, moving tensioning fingers into contact with the axially extending portion of said strand to maintain tension in said strand as said strand is twisted, removing said tensioning fingers from contact with said strand, invaginating said cord into said strand to form an end wall, and axially compressing said invaginated cord against said end wall to form an end closure.

4,411,049

RETAINER STRAP

Norm E. Cristea, 2801 Barkman, Pontiac, Mich. 48055

Filed Dec. 16, 1980, Ser. No. 217,030
Int. Cl.³ B65D *63/02*
U.S. Cl. 24—20 EE 9 Claims



1. A retainer strap comprising a head portion and a tail portion,

said head portion having two spaced-apart apertures therethrough and being comprised of a section of said strap folded substantially onto itself so that said apertures are in substantial alignment with one another, and

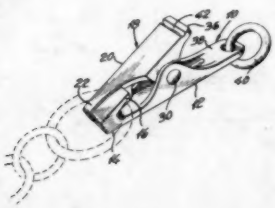
said tail portion being adapted to be inserted through said apertures to form a loop, and wherein a free end of said tail portion is foldable onto itself after being inserted through said apertures to put the loop in a holding configuration, and wherein a tab member formed on the end of said strap opposite said tail portion is foldable onto a portion of said folded free end to put the loop in a locking configuration, and wherein part of said head portion is also foldable with said tab member.

4,411,050

JEWELRY CLASP

Guy Couture, 21 St. Paul St., Ste. Brigitte de Laval, Canada G0A 3K0

Filed Aug. 6, 1982, Ser. No. 405,944
Claims priority, application Canada, Aug. 24, 1981, 384472
Int. Cl.³ A44B *13/02*
U.S. Cl. 24—234 4 Claims



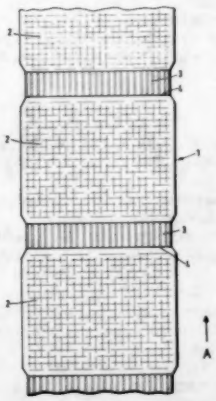
1. A jewelry clasp to removably attach a ring of a jewelry chain, comprising a pair of similar elongated planar elements extending opposite each other in the same general direction, each of which has a jaw at one end, a central body portion and a flat projection at its other end, said central body portion being of U-shape cross-section defining a pair of flat side legs projecting at right angles to the planar element and in transverse register, the legs of one of said elements directed towards and lapping the legs of the other element, a pivot rod extending through said legs transversely of said clasp, each jaw forming an integral hook, of U-shape cross-section, defining a web portion and a free tip, said hooks directed towards each other with their tip directed towards said pivot rod, said hooks taking a closed position upon relative pivotal movement of said elements about said pivot rod in a direction in which said jaws move towards each other, said hooks in said closed position lapping each other at a respective contact surface, which is inclined relative to said pivot rod, both hooks, when in closed position, defining a substantially continuous inside ring contact surface which, in a plane containing the longitudinal axis of said rod, is convex and has a radius of curvature substantially equal to the radius of curvature of the inside circumference of said ring, and a length sufficient to contact a substantial portion of the inside circumference of said ring, said inside ring contact surface, in a plane perpendicular to said axis of said pivot rod, being concave with a radius of curvature substantially equal to the radius of curvature of the cross-section of said ring, whereby said ring is contacted by said ring contact surface of said closed hooks over a substantial portion of its cross-section and, when taut, prevents opening of said hooks, the thickness of said web being much greater than the thickness of said tips to prevent deformation of the latter under stress, even when said clasp is made of a malleable precious metal, such as gold, a spring biasing said hooks in closed position, said spring including a central coiled portion surrounding said pivot rod between said legs, said flat projections providing finger actuated means for opening said hooks against the bias of said spring, one of said projections being longer than the other projection and having means to attach another jewelry chain ring.

4,411,051

PROCESS FOR HEAT TREATING TEXTILE MATERIAL ITEMS

Gero Ehemann, Gross-Ippener, Fed. Rep. of Germany, assignor to Kurt Ehemann Spezialmaschinenfabrik KG, Fed. Rep. of Germany

Filed Apr. 27, 1981, Ser. No. 257,544
Claims priority, application Fed. Rep. of Germany, Apr. 28, 1980, 3016365
Int. Cl.³ D06C *23/04*; F25B *29/00*
U.S. Cl. 26—18.5 14 Claims



1. A process for heat treating textile material webs, in particular knit fabric, characterized in that the textile material web is, in the regions in which it is to be protected during heat treatment from too intense an influence of steam, hot air or heat, cooled under the influence of a chilling or cooling agent to a

temperature selected to be so low that the material web during the subsequent heat treatment is only still reheated to a temperature that is not detrimental to the textile material web.

4,411,052

METHOD FOR MANUFACTURING AN ULTRASONIC TRANSDUCER ARRANGEMENT

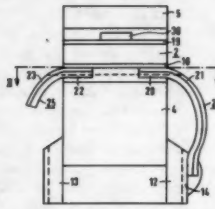
Erich Kämpf, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,455

Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019420

Int. Cl.³ H04R *17/00*

U.S. Cl. 29—25.35 **1 Claim**



1. In a method for the manufacture of an ultrasonic transducer arrangement having transducer elements which are provided with contact tabs of a contact foil, in which at least one flat side of a plastic foil serving as the contact foil is provided with a metal coating, and at least one flat side of a strip-shaped piezoelectric body is connected undetachably to a surface area of the metal coating of the contact foil, the other flat side of said contact foil being fastened to a damping body, and in which the piezoelectric body is subdivided into elements, several adjacent transducer elements forming a transducer group of transducer elements which are acoustically separated and electrically controlled in common, the improvement comprising:

(a) connecting transducer elements of the respective transducer groups to the metallic part of a contact foil having parts overhanging at both ends of the transducer elements, said contact foil separated into contact tabs for the individual transducer groups;

(b) connecting the tab at one end to a control conductor; and

(c) using the tab at the outer end to form electrically conductive bridges for the transducer elements of its transducer group.

4,411,053

ARRANGEMENT FOR EXCHANGING SUPPORTING OR DRIVING ROLLERS OF A CONTINUOUS CASTING PLANT

Werner Scheurecker, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jun. 19, 1980, Ser. No. 161,144

Claims priority, application Austria, Jul. 25, 1979, 5129/79

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—267 **5 Claims**

1. In an arrangement for exchanging supporting or driving rollers of a continuous casting plant of the type including:

a strand guide,

a first roller way and a second roller way arranged opposite each other on said strand guide and having bearing means accommodating rollers,

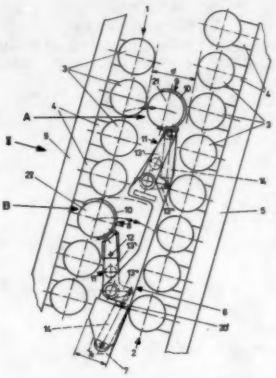
a sled adapted for movement between said first and said second roller ways for transporting a desired roller to and away from its respective bearing means,

roller seats on said sled for receiving a roller, and

moving means for moving a roller from its respective bearing means to said sled, and from said sled to its respective bearing means,

the improvement wherein:

said moving means comprises an adjustment means, and said roller seats are mounted on pivot arms hinged to said sled so as to be movable by operation of said adjustment means when said sled is between said roller ways, in a direction transverse to the longitudinal direction of said rollers,



between a transporting position in which said roller seats are retracted in said sled and an engagement position in which said roller seats project out of said sled, and wherein each of said roller seats includes a projection and each of said pivot arms includes a stop, said roller seat projection contacting said pivot arm stop when in said retracted position and contacting a roller adjacent the roller to be exchanged when in said engagement position.

4,411,054

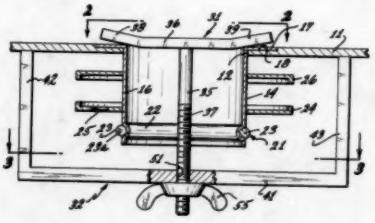
ART OF INSTALLING A SINK DRAIN FLANGE ASSEMBLY CAPABLE OF SUPPORTING A GARBAGE DISPOSAL

William Zeileaga, 10237 Walnut St., Beliflower, Calif. 90706

Filed Jul. 27, 1981, Ser. No. 287,521

Int. Cl.³ B23P *11/02;* **B25B** *27/14;* **B23Q** *1/00*

U.S. Cl. 29—434 **3 Claims**



1. A device for temporarily securing a drain flange tube within a drain hole of a sink, said device comprising:

a U-shaped yoke having an aperture substantially disposed at its center;

a tee-bolt having a threaded body and a cross bar disposed perpendicularly to said threaded body;

said threaded body having a diameter which allows it to pass through said aperture;

a nut for threading onto said body;

said cross bar has upturned ends which turn away from said threaded body.

3. A method of installing a sink drain flange tube assemly into a drain hole of a sink wherein the drain flange tube has at least one freely floating ring to be disposed therearound and a split ring of the spring type mounted in an external groove adjacent the end of the tube remote from the flange of the drain flange tube and for holding the floating ring in place, said method comprising:

placing the drain flange tube into the hole of said sink;

dropping a tee-bolt having a cross bar and a threaded body down through said drain flange tube with the cross bar resting on said drain flange and said threaded body depending through said drain flange tube;

holding a floating ring around the depending portion of said drain flange tube and said threaded body;

placing a U-shaped yoke having a centrally disposed aperture under said sink with the ends of said yoke touching said sink and said threaded body disposed through said aperture;

tightening a nut onto said threaded body to cause said yoke to be urged against said sink;

expanding said split ring so that said threaded body passes through the expanded ends, and;

placing said split ring into said groove.

4,411,055

VASCULAR GUIDING CATHETER ASSEMBLY AND VASCULAR DILATING CATHETER ASSEMBLY AND A COMBINATION THEREOF AND METHODS FOR MAKING THE SAME

John B. Simpson, Menlo Park, and Edward W. Robert, Cupertino, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mt. View, Calif.

Division of Ser. No. 151,175, May 19, 1980, Pat. No. 4,323,071, which is a continuation-in-part of Ser. No. 123,713, Feb. 21, 1980, abandoned, which is a continuation of Ser. No. 899,061, Apr. 24, 1978, abandoned. This application Aug. 10, 1981, Ser. No. 291,233

Int. Cl.³ B23P *11/02;* **B29C** *23/00*

U.S. Cl. 29—447 **6 Claims**

1. In a method for forming a dilating catheter assembly, providing first and second flexible tubular members formed of a heat-shrinkable material, the second tubular member having a diameter greater than that of the first tubular member, the first and second tubular members having proximal and distal ends, heating a portion of the second tubular member adjacent the distal end to a temperature above a predetermined temperature and introducing a fluid under pressure to cause expansion of said portion to form an inflatable annular portion and cooling the same while under pressure to maintain said inflatable annular portion in said second tubular member, inserting a mandrel into the first tubular member, heating the first tubular member to shrink it onto the mandrel, inserting the first tubular member with the mandrel therein into the second tubular member, heating the distal end of the second tubular member to cause it to shrink onto the first tubular member with the mandrel therein to form an adhesive-free seal between the distal ends of the first and second tubular member, and providing a fitting on the proximal ends of the first and second tubular members, said fitting having passages which are in communication with a passage in the first tubular member extending therethrough from the fitting to the distal end and in communication with a passage in the second tubular member extending from the fitting into the inflatable annular portion.

4,411,056

PRODUCTION OF STEEL PRODUCTS WITH MEDIUM TO HIGH CONTENTS OF CARBON AND MANGANESE AND SUPERIOR SURFACE QUALITY

Dionisyj W. Demianczuk, Parma; Gregory J. McLean, Brecksville, and Joseph E. Franklin, Medina, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Division of Ser. No. 139,873, Apr. 14, 1980, Pat. No. 4,348,800. This application May 20, 1982, Ser. No. 380,269

Int. Cl.³ B22D *23/06*

U.S. Cl. 29—527.7 **9 Claims**

1. A method of making a high-strength steel product, comprising pouring an ingot mold 80% to 95% full of molten steel consisting essentially of 0.01 to 0.12% C, 0.1 to 0.6% Mn, 0 to 2.0% Cu, 0.15 max. % P, and 0.10 max. % S, balance iron and incidental elements, allowing said filling to undergo rimming action while a shell of rimmed essentially ferritic steel solidifies next to the mold surrounding a still-molten core, and then completing pouring of said molten steel into said ingot mold while adding to the molten steel in the mold sufficient manganese so that the core of the ultimate, filled ingot contains manganese in the range above 0.6%, to 1.75%, said addition to the molten steel in the mold during said completion of pouring also including adding material to provide a total core content of 0.01 to 0.9% C, 0 to 0.20% P, 0 to 0.5% S, 0 to 3.5% Si, 0 to 0.5% Al, 0 to 0.75% of each of one or more of the elements Cb, V, Ti and Zr, 0 to 0.075% B, 0 to 2.0% Cu, 0 to 2.0% Cr, 0 to 3.5% Ni and 0 to 1.0% Mo; and after solidification of the said ferrite-shell-carrying ingot, converting, by rolling that part of the solid ingot which was poured first and which constitutes at least about the lower 80% of the solid ingot, to a rolled product having a skin of rimmed steel which is essentially ferrite over the principal surface area of the product, and beneath said skin a core containing manganese in greater proportion than 0.6%, said addition of manganese or of material containing carbon as well as manganese during said completion of pouring of the first-defined molten steel being effected by injecting solid material containing manganese or manganese and carbon so that such manganese addition or manganese and carbon addition enters the molten steel in the mold while the stream of molten steel, which completes the pouring, falls into the steel in the mold.

4,411,057

METHOD OF MANUFACTURING A LASER SOURCE WITH STAMPED SUPPORT

Eugène Duda; Claude Tondu, and Alain Maumy, all of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 39,745, May 16, 1979, abandoned. This application Oct. 20, 1981, Ser. No. 312,971

Claims priority, application France, May 18, 1978, 78 14762

Int. Cl.³ H01L *21/58, 23/36, 33/00*

U.S. Cl. 29—569 L **2 Claims**

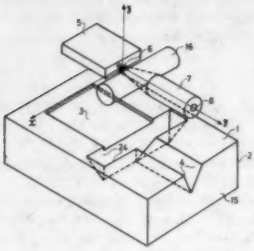
1. A method of manufacturing a semiconductor laser source including a laser chip and at least one optical fiber for collecting the radiation supplied from said laser chip on a support made of a cold-malleable metal of high thermal conductivity, said method comprising the steps of:

stamping, in a single operation, said support to permanently deform said support to have on a surface of said support, a flattened area and at least one Vee-shaped groove, acting as a recess for said optical fiber;

disposing said chip on said flattened area; and

disposing said at least one optical fiber in said at least one Vee-shaped groove, said stamping step forming said flat-

tened area at such a depth below said surface and said Vee-shaped groove at such a width and depth below said



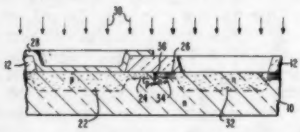
surface that light emitted from said chip is directed to said at least one fiber.

4,411,058

PROCESS FOR FABRICATING CMOS DEVICES WITH SELF-ALIGNED CHANNEL STOPS

John Y. Chen, Los Angeles, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

Filed Aug. 31, 1981, Ser. No. 297,903
Int. Cl.³ H01L *21/265*
U.S. Cl. 29—571 **27 Claims**



1. A process for fabricating CMOS devices formed on a semiconductor substrate provided with n-channel and p-channel regions of n- and p-type conductivity, respectively, which includes forming source, drain and gate portions in said regions and making electrical contacts to said portions, wherein the improvement comprises forming self-aligned channel stops between regions of the same conductivity and between regions of the opposite conductivity by

(a) forming a mask overlying and aligned with a number of said regions;
(b) implanting a number of first channel stops and well regions of one conductivity type;
(c) forming a layer overlying said regions;
(d) removing said mask and the corresponding portion of said layer, so as to leave the remaining portion of said layer overlying and automatically aligned with a number of said regions; and
(e) implanting a number of second channel stops and well regions of the opposite conductivity type.

4,411,059

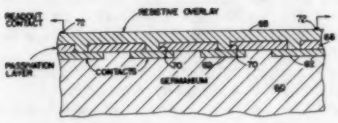
METHOD FOR MANUFACTURING A CHARGE SPLITTING RESISTIVE LAYER FOR A SEMICONDUCTOR GAMMA CAMERA

Philip A. Schlosser, Columbus, and Don W. Miller, Westerville, both of Ohio, assignors to Picker Corporation, Cleveland, Ohio

Division of Ser. No. 86,464, Oct. 18, 1979, Pat. No. 4,292,645. This application Aug. 18, 1980, Ser. No. 178,886
Int. Cl.³ H01L *21/283, 31/18*
U.S. Cl. 29—572 **2 Claims**

1. A method for manufacturing a solid state gamma ray detector comprising:

(a) providing a portion of high purity intrinsic semiconductor material having two opposed surfaces;
(b) regionally doping at spaced intervals both surfaces of the semiconductor material portion with parallel bands of p type material on one surface and orthogonal parallel bands of n type material on an opposed surface;
(c) applying a passivation layer over at least a portion of the regionally doped surfaces and providing an opening



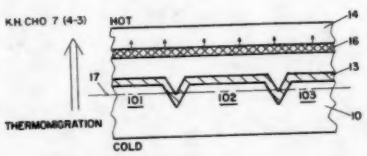
through the passivation layer communication with the doped intervals on each surface;
(d) applying a resistive layer over at least a portion of the passivation layer, including application of material of the resistive layer within the opening of the passivation layer for conductive communication between the doped intervals on each surface and the resistive layer, and
(e) providing at least one electrical contact on said resistive layer for each surface.

4,411,060

METHOD OF MANUFACTURING DIELECTRICALLY-ISOLATED SINGLE-CRYSTAL SEMICONDUCTOR SUBSTRATES

Kon H. Cho, West Windsor Township, Mercer County, N.J., assignor to Western Electric Co., Inc., New York, N.Y.

Filed Jul. 6, 1981, Ser. No. 280,600
Int. Cl.³ H01L *21/76*
U.S. Cl. 29—576 W **7 Claims**



1. Method of manufacturing dielectrically-isolated single-crystal semiconductor island regions for semiconductor integrated circuits comprising the steps of:

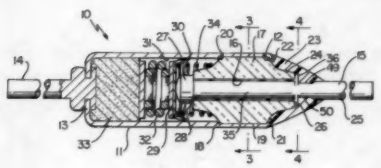
contacting a first single-crystal semiconductor wafer having a dielectrically-coated major surface with spaced-apart grooves therein and a major surface of a second single-crystal semiconductor wafer with an intermediate thin metallic body positioned therebetween;
heating the contacted structure to join said first and said second single-crystal wafer and to fill the dielectrically-coated spaced-apart grooves with metal from the thin metallic body;
thermomigrating the metal of said thin metallic body through and out of said second single-crystal wafer and recrystallizing the second single-crystal wafer into a single-crystal semiconductor support region; and
removing material from the surface opposite said grooved major surface of the first wafer until said spaced-apart grooves are exposed thereby forming single-crystal island regions supported by the recrystallized single-crystal semiconductor support region.

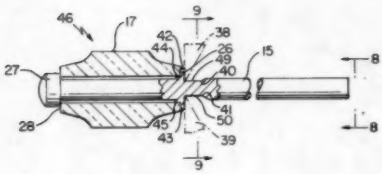
4,411,061

METHOD OF MAKING A THERMAL SWITCH HAVING A LEAD INTERLOCKED THERETO BY A SKIVED PART OF THE LEAD

Allen R. Clapper, and Burlin Davis, both of Laurel County, Ky., assignors to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 277,647, Jun. 26, 1981, abandoned. This application Sep. 24, 1982, Ser. No. 422,598
Int. Cl.³ H01H 69/00
U.S. Cl. 29—622 5 Claims





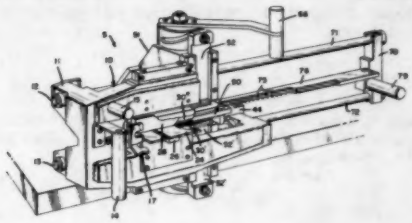
1. In a method of making a thermally actuatable electrical switch construction having a housing means carrying an electrically insulating end plug provided with an opening means passing therethrough and in which a portion of a conductive lead is disposed so that opposed ends of said lead extend beyond opposed ends of said end plug and respectively define a fixed contact means inside said housing means and a terminal means outside said housing means, said lead having means interlocking with said end plug to tend to prevent axial movement of said lead into said housing means, said means of said lead that interlocks with said end plug comprising an integral part of said terminal means that extends outboard of said opening and is disposed against the respective opposed end of said end plug that is adjacent said terminal means whereby said lead and said part thereof comprise a one-piece member, said switch construction having a sealing compound disposed on said respective end of said end plug so as to extend onto said terminal means outboard of said part thereof whereby said compound covers said part, said compound extending into said opening from said respective end of said end plug and surrounding said portion of said lead within said end plug, the improvement comprising the steps of skiving said part from said lead, and compacting said skived part against said respective opposed end of said end plug, said steps of skiving and compacting comprising the step of forming said part to comprise a plurality of circumferentially spaced apart tab-like members extending substantially radially from said terminal means against said respective opposed end of said end plug and respectively having portions disposed in said opening in said end plug in circumferentially spaced apart relation to tend to center said portion of said lead in said opening of said end plug and to interlock with said compound in said opening to tend to prevent rotational movement of said lead relative to said end plug.

4,411,062

APPARATUS AND METHOD FOR TERMINATING RIBBON CABLE

Kenneth F. Folk, and Mark F. Jackson, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 21, 1981, Ser. No. 227,016
Int. Cl.³ H01R 43/04
U.S. Cl. 29—749 23 Claims



1. An apparatus for terminating the separated conductors at the free end of a ribbon cable to terminals in opposite sides of a connector, said apparatus comprising:

a conductor programming station having means for deflecting adjacent conductors of said cable in opposite directions from the plane of the cable, alternate conductors being deflected in the same direction, said conductor programming station lying on a linear path;

connector positioning means movable on said linear path relative to said programming station, said positioning means having means for holding said connector and positioning said connector between said oppositely deflected conductors subsequent to deflection at said programming station;

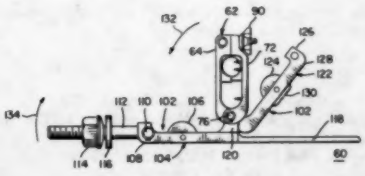
a terminating station movable on said linear path relative to said programming station and said connector positioning means, said terminating station being located between first and second insertions rams having means for terminating said conductors to said terminals in said connector while said connector is positioned between said oppositely deflected conductors.

4,411,063

SPLICE INSTALLING TOOL

Michael A. Grundfest, Queens County, N.Y., assignor to Thomas & Betts Corporation, Raritan, N.J.

Continuation of Ser. No. 55,638, Jul. 9, 1979, abandoned. This application May 5, 1981, Ser. No. 260,731
Int. Cl.³ H01R 43/04
U.S. Cl. 29—751 15 Claims



1. An installing tool for crimping a hollow sleeve upon two or more elongate conductors having insulation thereabout, the ends of said conductors being exposed, comprising: sleeve retention means to retain a hollow sleeve in a fixed position; conductor retention means adjacent said sleeve retention means and movably coupled thereto for engaging at least two conductors and retaining same within, and in a fixed position

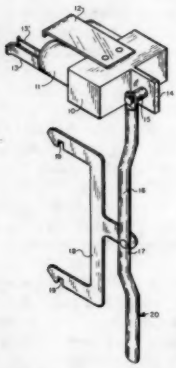
relative to, said hollow sleeve, said conductor retention means comprising a pair of selectively positionable lockable arms, one of such arms to each side of said sleeve retention means, each of said arms having at least one spike thereon to engage the insulation of a conductor and retain such conductor in said conductor retention means with the exposed end thereof in said hollow sleeve when said arm is in a closed position and locked; and crimping means adjacent said sleeve retention means and selectively operable to crimp said hollow sleeve onto said conductors to form an electrical and mechanical joint therebetween.

4,411,064

CIRCUIT CARD EXTRACTOR

James V. Koppensteiner, Chicago, and Joseph B. Onesto, Oak Lawn, both of Ill., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Jun. 18, 1981, Ser. No. 275,085
Int. Cl.³ H05K *3/36*
U.S. Cl. 29—764 **5 Claims**



1. A tool for facilitating the extraction of a printed circuit card from a holder, the latter having top and bottom parallel card guides each card guide including at least one transversely oriented guide track having respective lateral card edges resting therein, said circuit card including a handle mounted to a transverse edge of said circuit card, said tool comprising:
a mounting body including at least one magnet and a retainer clip, said magnet and retainer clip extending outward from a front face of said mounting body arranged to engage and attach said mounting body to said top card guide;
a handle rotatably mounted to said mounting body; and
a U-shaped linkage rotatably mounted to said handle said linkage including means for interlockingly engaging said circuit card handle;
whereby a pulling force applied to said handle extracts said circuit card from said holder.

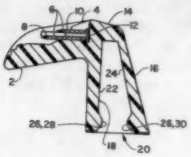
4,411,065

SHAVING CARTRIDGE ASSEMBLY

Robert A. Trotta, Pembroke, Mass., assignor to The Gillette Company, Boston, Mass.

Filed Feb. 25, 1982, Ser. No. 352,150
Int. Cl.³ B26B *21/14*
U.S. Cl. 30—47 **7 Claims**

1. A shaving cartridge assembly comprising a platform portion, a cap portion, blade means disposed between said cap and platform portions, a back portion interconnecting said cap and platform portions, and a housing portion defined in part by said back portion and extending therefrom, said housing portion having an opening at one end thereof, said housing portion being adapted to receive a handle member substantially axially of said housing for connecting said assembly to said handle, and detent means extending inwardly of said opening from



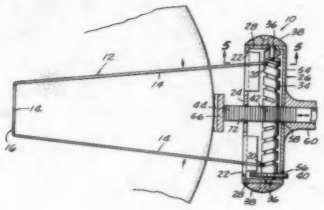
interior wall means of said housing portion, said detent means being adapted to snap into corresponding recess means on said handle.

4,411,066

CAKE CUTTER

Edward Allahverdian, 426 Wing St., #3, Glendale, Calif. 91705

Filed Jan. 6, 1983, Ser. No. 456,281
Int. Cl.³ A21C *15/04*
U.S. Cl. 30—114 **12 Claims**



1. A cake cutter comprising:
a housing having a top wall, a bottom wall, a rear wall, two side walls and a front plate;
a helical screw member having one side with helixes diverging to the right of center and the other side with helixes diverging to the left of center, and journaled into said side walls of said housing;
a pinion mounted on said helical screw member;
a three sided cutting blade having an apex end and two longitudinal sides, with the inner ends of said longitudinal sides formed to ride respectively on the helixes of said screw member;
a length limiting plate located in front of said front plate, and maintained in position by securing means; and
rack means having a handle member for moving said longitudinal cutter sides towards each other in conjunction with said pinion and said helical screw to secure a cut portion of a cake.

4,411,067

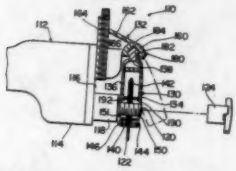
BLADE HOUSING DEVICE FOR CAST CUTTING TOOL

Norbert A. Kirk, 43 E. Ohio St., Room 930, Chicago, Ill. 60611

Filed Aug. 18, 1981, Ser. No. 294,006
Int. Cl.³ B27B *9/02*
U.S. Cl. 30—124 **18 Claims**

1. A cast saw device for cutting a cast comprising:
a cast cutting tool having a body, a shaft extending from said body, and a movable circular saw blade mounted on said shaft;
a housing device comprising a housing and an attaching means for attaching said housing to said body, said housing enclosing a substantial portion of said saw blade, said housing having a side periphery between front and rear

walls thereof and a slot in said side periphery through which a portion of the edge of said saw blade projects varying distances, whereby the depth of cut of said saw blade is determined by the portion of the side periphery which is positioned in contact with the cast; and



an aperture in said front and rear walls through which said shaft extends and lips extending inwardly from said walls and surround each said aperture to substantially surround said shaft up to said slot whereby the dust collected in said housing is retained therein.

4,411,068

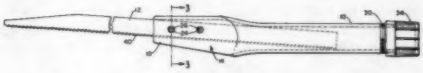
HAND SAW

Panos Theodorides, 595 River St., Mattapan, Mass. 02126

Filed Jul. 20, 1981, Ser. No. 284,735

Int. Cl.³ B23D *45/00*

U.S. Cl. 30—166 R **5 Claims**



1. A hand saw comprising

a straight, hollow, tubular handle, one end of the handle being collapsed to form two closely spaced parallel walls with a slot cut through the handle at adjacent edges of said walls and aligned with the space between the walls,

threads provided on the other end of the handle to enable a handle extension to be secured thereto,

a straight band saw-type blade with teeth along one edge, narrower than the parallel walls so that the blade is fully confined by the handle to the very end of the handle at the collapsed end, said blade also having one end disposed between the closely spaced parallel walls and with the teeth of the saw facing the slot, said blade being axially aligned with the handle so as to form an extension thereof,

and a pair of set screws mounted in one of the parallel walls and bearing against one side of the blade to releasably retain the blade on the handle.

4,411,069

SPOOLLESS STRING TRIMMER HEAD

Albert R. Close, Culver City, and Winton Oster, Los Angeles, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.

Division of Ser. No. 199,563, Oct. 22, 1980, Pat. No. 4,335,510. This application May 10, 1982, Ser. No. 376,470

Int. Cl.³ A01D *50/00*

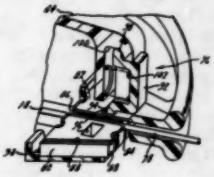
U.S. Cl. 30—276 **6 Claims**

1. A head for a trimmer using flexible trimming line as the cutting implement comprising:

housing means for containing a coil of trimming line, said housing means having an opening therethrough for egress of said trimming line, said opening being disposed in communication with the center of said coil through said opening to project the free end of said trimming line generally radially-outwardly from said housing means, said housing means being adapted to be rotated at high speed to rotate said coil and the generally radially-outwardly projecting free end of said trimming line therewith; and

clamping means associated with said housing means for securing said trimming line during rotation of said housing means and for releasing said coil through said opening without rotation of said coil said clamping means comprising;

a button member which is manually movably with respect to said housing means for releasing and clamping said trimming line;



a clamping member resiliently biased in a direction to cause clamping of said trimming line and which is movable against said resilient bias when said button member is manually moved to release said trimming line; and

movement defining means including a slot and a rail residing in said slot, one of said slot and said rail being associated with said housing means and the other of said slot and said rail being associated with said clamping member, said slot and said rail causing said clamping member to move linearly in one direction to release said trimming line and linearly in the opposite direction to clamp said trimming line.

4,411,070

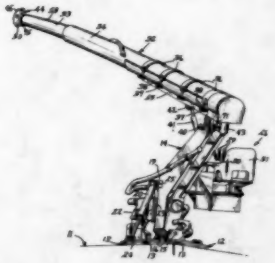
TREE-TRIMMING APPARATUS

George A. Boyum, North Mankato; Robert A. Renner, Mankato, and Ralph Lovelace, Edina, all of Minn., assignors to Jarraff Industries, Inc., North Mankato, Minn.

Continuation of Ser. No. 132,535, Mar. 21, 1980, abandoned. This application Sep. 23, 1981, Ser. No. 304,840

Int. Cl.³ B27L *1/00*

U.S. Cl. 30—379.5 **44 Claims**



9. A tree-trimming apparatus comprising:

a mobile support;

pump means for supplying fluid under pressure;

an engine drivingly connected to said pump means;

a turntable rotatably mounted about a vertical axis on said mobile support;

a first fluid pressure operated motor means operatively connected to said turntable for imparting rotational motion to said turntable about said vertical axis;

first conduit means for connecting said first motor means to said pump means;

a pedestal pivotally mounted about a horizontal axis on said turntable;

first fluid pressure operated cylinder means operatively connected between said pedestal and turntable for imparting pivotal motion to said pedestal about said horizontal axis;

second conduit means for connecting said first cylinder means to said pump means;

a boom comprising an inner boom member telescopically contained in an outer boom member, said boom pivotally mounted on said pedestal about an axis normal to said horizontal axis;

second fluid pressure operated cylinder means operatively connected between said boom and said pedestal for imparting pivotal motion to said boom about said axis normal to said horizontal axis;

third conduit means connecting said second cylinder means to said pump means;

second fluid pressure operated motor means operatively connected to said inner boom member for imparting boom extending and boom retracting movements to said inner boom member;

fourth conduit means for connecting said second motor means to said pump means;

a circular saw mounted on the end of said boom;

third pressure operated motor means operatively connected to said circular saw for imparting rotational cutting motion to said circular saw;

fifth conduit means for connecting said third motor means to said pump means.

4,411,071

CHAIN SAW

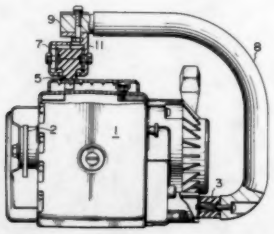
Hiroshi Takahashi, Fussa, and Yasuo Saito, Fujisawa, both of Japan, assignors to Kioritz Corporation, Japan

Filed Oct. 9, 1981, Ser. No. 310,351

Claims priority, application Japan, Oct. 13, 1980, 55-145337[U]

Int. Cl.³ B27B *17/02*

U.S. Cl. 30—381 **1 Claim**



1. A chain saw comprising: an engine block including an engine for driving a saw chain; and a front and a rear handle provided respectively at the front and rear parts of said engine block, said handles being connected at their one ends to said engine block in a vibration absorbing manner through vibration damping members, while the other ends of said handles oppose to each other and are connected to each other at least at two points through respective vibration damping members, at least one of said vibration damping members connecting said other ends of said handles being substantially T-shaped and connected to said engine block.

4,411,072

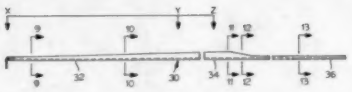
VARIABLE STIFFNESS RULE BLADE, RULE EMPLOYING SAME, AND METHOD OF MAKING SAME

Edward C. Rutty, Portland, and Carl C. Stoutenberg, Burlington, both of Conn., assignors to The Stanley Works, New Britain, Conn.

Filed Sep. 30, 1982, Ser. No. 430,676

Int. Cl.³ G01B *3/10*

U.S. Cl. 33—138 **20 Claims**



1. A coilable rule blade having greater standout length comprising an elongated strip of resiliently deflectable metal having a substantially unform width in its coiled flattened state and, in its uncoiled state, a concavo-convex cross section along substantially its entire length, said cross section having a central segment of arcuate configuration defined by a radius R and having a depth H, said blade having a first portion in which the radius R of the central segment of the cross section gradually decreases and the depth H of the cross section gradually increases from values R_1 and H_1 respectively adjacent one end to values of R_2 and H_2 respectively at a point beyond the normal breakpoint of a blade of that width and having a cross section approximating that of the value of $\frac{1}{2}(R_1+R_2)$ and $\frac{1}{2}(H_1+H_2)$ respectively, said radius thereafter increasing and said depth of cross section decreasing towards the other end of the blade to values of R_3 and H_3 respectively; and a second portion in which the radius R_3 and depth of cross section H_3 are substantially uniform over the length thereof and which extends to adjacent said other end of said blade.

4,411,073

PITCH TESTING APPARATUS

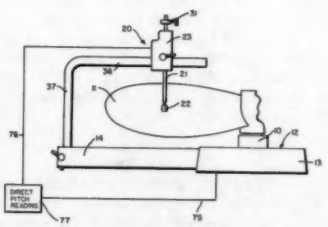
Terence J. Ryan, 39 Egerton St., Southport, Queensland, Australia 4215.

Filed Jul. 13, 1981, Ser. No. 282,508

Claims priority, application Australia, Jul. 11, 1980, PE4485

Int. Cl.³ G01B *5/24, 7/30*

U.S. Cl. 33—174 C **12 Claims**



1. An instrument for measuring the pitch of a propeller blade comprising:

(a) a probe shaft mounted for axial movement;

(b) means for maintaining the probe shaft in constant contact with the propeller blade at a fixed radial distance from the center of the blade;

(c) means for providing continuous relative rotation between the probe shaft and the blade;

(d) means for determining the amount of relative angular rotation between the blade and probe shaft;

(e) means for determining the amount of axial movement of the probe shaft during the relative angular rotation; and

(f) means for providing a direct reading of the pitch of the

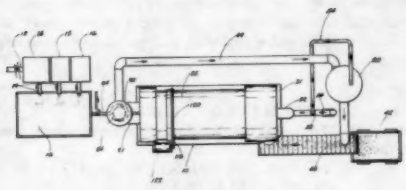
propeller blade at the radial distance at which the probe shaft is located and over the part of the blade traversed by the probe shaft based on the amount of relative angular rotation and the axial movement of the probe shaft.

4,411,074

PROCESS AND APPARATUS FOR THERMALLY DRYING OIL WELL CUTTINGS

Charles L. Daly, 205 Baker St., Broussard, La. 70518

Filed Sep. 4, 1981, Ser. No. 299,543
Int. Cl.³ F26B *3/04*
U.S. Cl. 34—32 **12 Claims**



1. A process for thermally aerating oil well drill cuttings to a substantially moisture-free state, comprising the following steps:

a. collecting the cuttings from an oil well bore and storing them in a retainer tank;

b. providing a cylindrical drying chamber with an exit end and an entrance end slightly elevated in relation to the exit end;

c. providing a spiral conduit connecting said retainer tank and said drying chamber;

d. feeding the cuttings into the drying chamber through said spiral conduit;

e. providing a source of pressurized air for assisting the movement of cuttings from said retainer tank down to said drying chamber;

f. providing a source of superheated air;

g. injecting the superheated air into the drying chamber to dry the cuttings;

h. rotating the drying chamber during the injection of the superheated air;

i. providing longitudinal trough-like means within the drying chamber for tumbling the cuttings within the chamber during the rotation of the chamber;

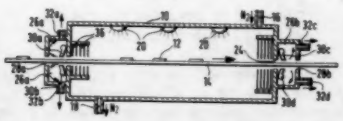
j. removing the dried cuttings from the drying chamber and conveying them into a storage tank.

4,411,075

PROCESS AND APPARATUS FOR DRYING OF SOLVENT CONTAINING MATERIAL

Bernd Blaudszun, Melsbach, Fed. Rep. of Germany, assignor to Lohmann GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Filed Oct. 14, 1981, Ser. No. 311,435
Claims priority, application Fed. Rep. of Germany, Oct. 14, 1980, 3038791
Int. Cl.³ F26B *3/04*
U.S. Cl. 34—32 **14 Claims**



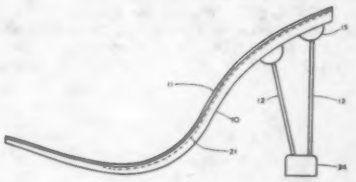
1. In a process for drying of solvent containing material, in which the material is conducted through a drying chamber containing an inert gas, and in which inert gas is introduced into at least one lock chamber preceding and/or following the drying chamber, the improvement comprising: producing an annular flow of inert gas in the lock chamber by jetting a minor amount of the inert gas required for drying the material into the lock chamber in proximity to an opening of the drying chamber and a mixture of inert gas and sucked-in external air being discharged from the lock chamber in the peripheral region of the annular flow; and introducing the major portion of the inert gas directly into the drying chamber.

4,411,076

SHOE CONSTRUCTION

Horace A. Wilkinson, 13 Korocan Rd., Lilli Pilli, New South Wales, 2229, Australia

PCT No. PCT/AU81/00011, § 371 Date Sep. 29, 1981, § 102(e) Date Sep. 29, 1981, PCT Pub. No. WO81/02092, PCT Pub. Date Aug. 6, 1981
PCT Filed Jan. 29, 1981, Ser. No. 308,555
Claims priority, application Australia, Jan. 29, 1980, PE2154
Int. Cl.³ A43B *21/00, 21/36*
U.S. Cl. 36—34 R **8 Claims**



8. A heel construction for a shoe comprising a plurality of load bearing pin members, each having an enlarged head at one end thereof; a like plurality of socket members, each socket member having a cavity therethrough, each said cavity including a first passage of a first cross-section less than the cross-section of said enlarged head and a second passage of a second cross-section greater than the cross-section of said enlarged head, one pin member passing through each socket member with the shank of each pin member passing through the first portion of its respective socket member and the enlarged head of each pin member within the second portion of the respective socket member; a single lower heel member attached to the second end of each of said pin members; and means for fastening said socket members to a shoe sole to form a heel for the shoe with said pin members being load bearing members between said lower heel member and the shoe sole.

4,411,077

ATHLETIC SHOE WITH ATTACHED ANKLE BRACE

Jerome A. Slavitt, 7402 York Rd., Towson, Md. 21204

Filed Jan. 5, 1982, Ser. No. 337,269
Int. Cl.³ A43B *7/14, 7/20*
U.S. Cl. 36—89 **2 Claims**

2. An ankle brace for an athletic shoe comprising a pair of opposite side elastic and flexible bracing straps for the shoe each having corresponding ends cut on an angle to the longitudinal axis of the strap, means attaching each cut end of the straps to the athletic shoe near the heel and near the connection of the heel with the shoe upper at posterior angles relative to the plane occupied by the shoe sole, whereby the straps when extended from their connected ends will assume posterior angles of inclination, and cooperative fastener components on the opposite end portions of the straps, one fastener component

being on the exterior of each strap relative to the shoe near and above the attached end of the strap and being adjacent to the

malleolus, and the other fastener component being on the other side of each strap near its free end portion.

4,411,078

DEVICE FOR CLOSING A SLOT IN AN UPPER OR GAITER OF A SKIING BOOT

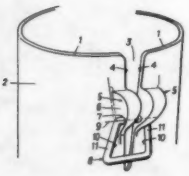
Erwin Bucheder, Köflach, Austria, assignor to Koflach Sportgerate Gesellschaft, Köflach, Austria

Filed Aug. 7, 1981, Ser. No. 291,078

Claims priority, application Austria, Aug. 28, 1980, 4365/80

Int. Cl.³ A43B *5/04, 11/00*

U.S. Cl. 36—117 **6 Claims**



1. A device for closing a slot in an upper or gaiter of a skiing boot, characterized in that the mutually opposite edge portions defining the slot carry outwardly protruding cams, which are formed with bearing holes, a U-shaped fastener is pivoted in said bearing holes on an axis that is transverse to the longitudinal axis of the slot, and said cams have inclined surfaces which face away from the slot and are adapted to cooperate with the confronting side faces of the legs of the fastener.

4,411,079

SUCTION DRAG SYSTEM

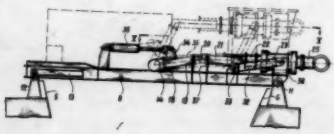
Arie de Jager, Sliedrecht, Netherlands, assignor to IHC Holland N.V., Pependrecht, Netherlands

Filed Nov. 10, 1981, Ser. No. 320,291

Claims priority, application Netherlands, Nov. 13, 1980, 8006209

Int. Cl.³ E02F *3/88*

U.S. Cl. 37—58 **7 Claims**



1. In a dredging vessel having a hold and coamings extending lengthwise of the vessel on opposite upper sides of the hold, the vessel having a suction drag system comprising a suction pipe with a suction pump, a discharge conduit for discharging dredged material into the hold, elbow means interconnecting the suction pipe and the discharge conduit, and derrick means by which the suction pipe may be moved outboard and lowered, and raised and brought inboard; the improvement comprising a plurality of support frames extending transversely across the hold and detachably secured at each end to a said coaming, at least one of said support frames carrying said derrick means and another of said support frames carrying said elbow means, said elbow means comprising parallelogram linkage disposed in a vertical plane transverse to the length of the vessel for raising and swinging inwardly, and lowering and swinging outwardly, the upper end of the suction pipe, a turnpiece providing a horizontal swivel joint between the elbow means and the upper end of the suction pipe about a horizontal axis transverse to the length of the vessel, and a horizontal cylinder for swinging said parallelogram linkage.

4,411,080

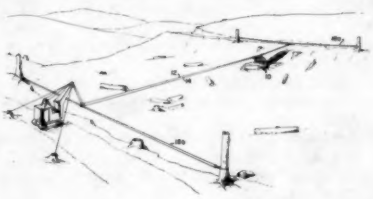
HIGH-LEAD YARDER RAKE

Donald B. Mann, 8811 131st Ave. Northeast, Lake Stevens, Wash. 98258

Filed Aug. 21, 1981, Ser. No. 295,077

Int. Cl.³ E02F *3/60, 3/48*

U.S. Cl. 37—117 **18 Claims**



1. A high-lead yarder rake capable of clearing brush, timber, and other debris at a logging site when hauled just above the surface along a main line with a main line yarder, comprising:

(a) a generally rectangular frame having a top, a bottom, two sides, a vertical, central cross-member extending between the top and bottom, and a horizontal tine support shaft extending between the sides;

(b) a plurality of leaf spring tines, pivotally mounted on the tine support with generally circular eyes to allow the tines to swing upwardly from the bottom of the frame, each tine extending downwardly to rest against the frame's bottom and projecting downwardly from the bottom;

(c) means to connect the rake to the main line to allow hauling of the rake along the main line;

(d) means to maintain the position of the rake relative to the main line when the rake is hauled; and

(e) means to maintain the spacing of the tines along the bottom of the frame.

4,411,081

TRENCH COMPACTOR HAVING A VIBRATORY SHEEPSFOOT ASSEMBLY

Reginald D. King, 16252 Colfax Hwy., Grass Valley, Calif. 95945

Filed Jan. 15, 1982, Ser. No. 339,616

Int. Cl.³ E02F *3/76;* **E01C** *19/38*

U.S. Cl. 37—117.5 **9 Claims**

1. A sheepsfoot assembly for mounting upon the lip of a dozer or other prime mover, which comprises:

an upper vibratory machine housing section for a motor and clutch assembly,

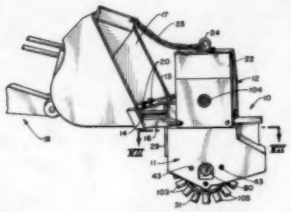
a motor and a clutch assembly mounted therein,

a lower vibratory sheepsfoot section undermounted thereto, said lower section having a sheepsfoot frame which in-

cludes a pair of spaced vertical side walls, and spaced front and rear walls, the rear of which is vertical and normal to said side walls,

a pair of spaced bearing mounts disposed interior of each side wall, a shaft journalled for rotation in said bearing mounts, a drum mounted to said shaft and rotatable therewith, said drum having a plurality of spaced rows of compacting teeth extending outwardly from the outer periphery of said drum,

means interconnecting said drum and said motor for vibrating said drum when said motor is actuated,



mount means for securing said sheepsfoot assembly to said prime mover, said mount means comprising a back flange secured generally vertically upon the rear wall of said lower section and a pair of vertically spaced parallel brackets extending rearwardly outward from and normal to said back flange for receiving said lip, and

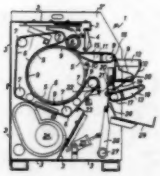
at least one pair of vertically aligned apertures disposed in said brackets and adapted to receive securing means therein.

4,411,082

LAUNDRY IRONING DEVICE WITH PIVOTED BLADE FOLDER

Francois Ferrage, La Rivieve-de-Corps, France, assignor to Dubix, Saint Julien les Villas, France

Filed Oct. 8, 1981, Ser. No. 309,761
Int. Cl.³ D06F 65/10
U.S. Cl. 38—9 **3 Claims**



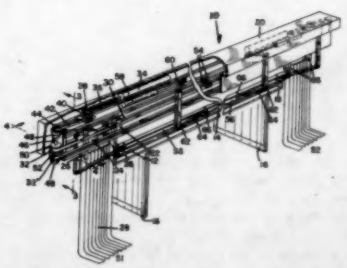
1. A drying and ironing device for the industrial treatment of long flat textile elements, said device comprising a casing, an engagement tank for the textile elements mounted at the front of the casing, a drying and ironing system mounted within said casing between the lateral flanks thereof and accessible from the front of the casing, said drying and ironing system comprising a heated cylinder, a guide path, mounted adjacent to said engagement tank inwardly thereof and comprising a frame about which endless drive strips are entrained, for delivering a textile element when the latter is discharged from the engagement tank, a drive cylinder, mounted near the discharge end of the guide path and adjacent said heated cylinder, for gripping the textile element when the latter is discharged from the guide path and for applying the textile element against the heated cylinder, a series of auxiliary cylinders disposed around the circumference of the heated cylinder from said drive cylinder to a discharge point constituted by the last auxiliary cylinder in the series in a direction measured from the drive cylinder around the circumference of the heated cylinder, and at least one endless belt disposed over the entire width of the heated cylinder and guided by said auxiliary cylinders such that the textile element is introduced between said endless belt and the heated cylinder and advances therebetween to the discharge point constituted by the last auxiliary cylinder for discharge from the drying and ironing system so as to hang down, after discharge, from the last auxiliary cylinder under the effect of gravity, and a system for folding the textile element and comprising a transverse folding blade, located beneath said last auxiliary cylinder and being fixed to a transverse support pivoting about a shaft which is disposed in a lower portion of the casing of the drying and ironing device directly below the discharge point of the drying and ironing system constituted by the last auxiliary cylinder and the longitudinal axis of which extends general parallel to the axis of the heated cylinder, electrical double-acting jack means for rocking said folding blade between two limit positions, means, for gripping and removing the textile element after the textile element has been folded through the action of said electrical double-acting jack means so as to straddle the folding blade, comprising a further guide path, extending outwardly of said casing beneath said engagement tank and formed by a plurality of endless strips entrained about a frame and driven by a further drive cylinder located at an input end of said further guide path in spaced relationship to an output end of said further guide path, and at least one presser roll bearing against said cylinder and disposed in a transversly oriented, freely rotatable manner at the end of a support member pivoting about a transverse axis located directly below the engagement tank, a receiver container disposed at the front of the casing under the further guide path and said engagement tank so as to receive the dried, ironed and folded textile element when the latter is discharged from the output end of said guide path, and means for automatically controlling said electrical jack means to provide rocking of the folding blade in one direction and then the other when the textile element, upon being discharged from the drying and ironing system, has unrolled by a given length corresponding to the formation of a fold on one side or the other of the folding blade, and to provide stopping and starting of the rocking of the folding blade at the end and beginning, respectively, of the process for folding the textile element, as well as for actuating said means for gripping and removing the folded textile element.

4,411,083

LAUNDRY SPREADER

Henry J. Weir, Chepstow, Wales, assignor to H. J. Weir Engineering Co., Ltd., England

Continuation-in-part of Ser. No. 209,018, Nov. 12, 1980, abandoned. This application Oct. 19, 1981, Ser. No. 312,533
Claims priority, application Ireland, Nov. 22, 1979, 2227/79
Int. Cl.³ D06F 59/08
U.S. Cl. 38—143 **5 Claims**



1. An apparatus for centering and spreading laundry articles

comprising: clipping means for gripping respective parts of a leading edge of a laundry article; respective carriages for conveying said clipping means; a track means along which said carriages can move from a contiguous initial position at a first loading station to a spaced apart position when the article has become fully spread out; an endless elongated means having a first run and a second run which extend along said track means; a lead carriage being fixed to said first run; a trailing carriage which idles with respect to said second run; an abutment means fixed to said second run and initially positioned equidistantly on the opposite side of a reference center-line from which said lead carriage is initially positioned therefrom while said carriages are at said leading station; and a drive means for moving said endless elongated means in one direction to draw said lead carriage along said track from said loading station and then in the reverse direction to return said lead carriage to said loading station, such that upon activation of said drive means, said endless elongated means moves in said one direction moving said lead carriage, with a respective laundry article edge gripped in said clipping means, along said track spreading out the laundry article, said lead carriage and said abutment means are moving toward each other crossing at said reference center-line then moving apart so that when said lead carriage draws one-half of the width of said article beyond said reference center-line, said abutment means will contact said trailing carriage having a respective edge of said article gripped in said clipping means, thus arresting further movement of said trailing and lead carriages and leaving said article spread and centered with respect to said reference line.

4,411,084

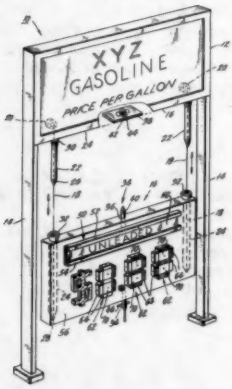
DISPLAY WITH CHANGEABLE CHARACTERS

John W. Kraus, Teaneck, N.J., assignor to Trans-World Manufacturing Corp., East Rutherford, N.J.

Filed Jun. 5, 1981, Ser. No. 271,001

Int. Cl.³ G09F *9/37*

U.S. Cl. 40—450 **40 Claims**



1. A changeable display, comprising:

a plurality of mechanical flip-flop elements, each said flip-flop element having a first side which is entirely of a first color, and a second side which is entirely of a second color;

a plurality of frame means, each said frame means for supporting and positioning a respective group of said flip-flop elements in an array, each array corresponding to a discrete character whereby said display is adapted to display several characters; and

resilient means which connect each said flip-flop element to its respective said frame means to enable each flip-flop element to be manually individually retracted away from its respective frame means and then rotated to have a desired one of its first and second sides face outwardly of the display.

4,411,085

SLIT-TUBE SIGN STAND

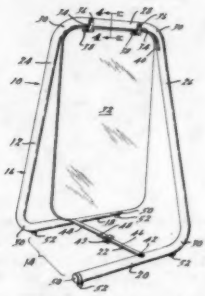
Ian W. Farmer, Waltham Cross, England, assignor to Arken, Inc., Bloomfield Hills, Mich.

Filed Jan. 7, 1982, Ser. No. 337,720

Claims priority, application United Kingdom, Feb. 13, 1981, 81998893

Int. Cl.³ G09F *15/00, 7/22*

U.S. Cl. 40—610 **7 Claims**



1. A sign stand for displaying advertising messages and the like comprising

a single piece of tubular material formed into a base structure with two leg members and an upstanding frame structure,

said frame structure having two upstanding side members and an upper cross-bar,

said upper cross-bar having torsion-relieving means therein to allow said leg members to be spread apart easily and without permanently deforming any of said tubular material,

said torsion-relieving means comprising a slot formed in said tubular material along the underside of said upper cross-bar, and

a sign panel attached to and positioned in said frame structure.

4,411,086

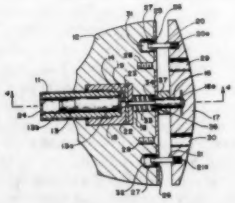
HAND HELD, SINGLE SHOT, FIREARM

John K. Christopherson, 9180 Falcon Cir., Sandy, Utah 84070

Filed Mar. 16, 1981, Ser. No. 243,719

Int. Cl.³ F41C *3/00*

U.S. Cl. 42—1 R **12 Claims**



1. A single-shot, hand-held firearm, adapted for use with a cartridge having a primer, comprising a body; a barrel secured to said body, said barrel being adapted to receive and hold the cartridge; a firing pin normally spaced from the cartridge but

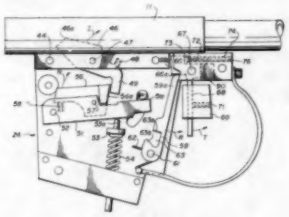
adapted to be moved toward the cartridge so that it strikes the primer thereof; barrier means immediately adjacent the firing pin in its normal unfired, but ready to be fired, position and interposed between the firing pin and the primer of the cartridge in spaced relationship from said primer, said barrier means being adapted to stop movement of the firing pin toward said primer and hold said firing pin spaced from said primer until a predetermined pressure is applied by the firing pin against the barrier means so that said firing pin abruptly penetrates said barrier means, said firing pin being otherwise unimpeded in its travel path toward the primer when the firearm is ready to be fired; and means by which sufficient pressure can be applied to the firing pin whereby the firing pin abruptly penetrates the barrier means, passes through the space between the barrier means and the primer of the cartridge, and strikes the primer with sufficient force to detonate said primer, thereby causing the firearm to fire.

4,411,087

TRIGGER MECHANISM FOR FIREARMS

Floyd O. Aikman, 27 Roberta Dr., Howell, N.J. 07731

Filed Oct. 23, 1980, Ser. No. 199,711
Int. Cl.³ F41C *19/00*
U.S. Cl. 42—69 A **7 Claims**



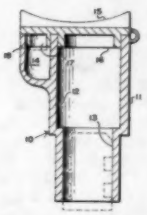
1. A trigger mechanism for a firearm such as a pistol or the like including a receiver, a bolt slideably disposed in said receiver, a firing pin slideably disposed in said bolt and means for yieldingly urging said firing pin from a retracted position into a firing position, a trigger housing mounted on said firearm, a trigger pivotally mounted on said housing, means for yieldingly urging said trigger in one direction of rotation, a sear pivotably mounted on said housing, means for yieldingly urging said sear in one direction of rotation for retaining engagement with said firing pin in said retracted position, trip means pivotally mounted on said trigger housing for movement between a first position and a second position, means for yieldingly urging said trip means from said first position into said second position, release means pivotally mounted on said trigger housing for retaining engagement with said trip means in said second position, means for yieldingly urging said release means into engagement with said trigger in a direction of rotation opposite said one direction of rotation of said trigger whereby rotation of said trigger in the opposite direction of rotation permits further movement of said release means out of said retaining engagement with said trip means and movement of said trip means into said first position for engagement with said sear to pivot said sear in the opposite direction of rotation out of said retaining engagement with said firing pin for movement of said firing pin from said retracted position into said firing position wherein said trigger includes a body pivotally mounted on said housing and a rod member for manually pivoting said trigger in said opposite direction, said trigger body including a stepped rear portion forming first and second surfaces, said release means being movable into one position in engagement with said first surface for retaining engagement with said trip means and being movable into a second position in engagement with said second surface for releasing said trip means wherein said trip means comprises a sear trip bar pivotally mounted at one end on said trigger housing, said trip bar having an outer end portion for retaining engagement with said release means in said second position, a sear trip pivotally mounted on said sear trip bar, spring means for yieldingly urging said sear trip in one direction of rotation into firing position, said sear trip being arranged to rotate in the opposite direction of rotation against said spring means for urging engagement with said sear in said firing position during the movement of said sear trip bar from said first position into said second position and into engagement with said sear during the pivotal movement of said sear trip bar from said second position into said first position for pivoting said sear out of retaining engagement with said firing pin.

4,411,088

WATER RESISTANT CHARGE CONTAINER FOR FIREARMS

Hugh R. Wilson, 10840 SW. 120th St., Miami, Fla. 33176

Filed Dec. 21, 1981, Ser. No. 332,606
Int. Cl.³ F42B *39/04*; F41C *27/00*
U.S. Cl. 42—90 **6 Claims**



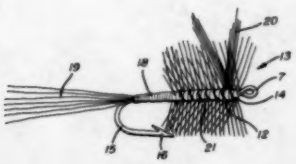
1. In a charge container for use with muzzle loading firearms, said container having a body, said body having a first chamber for containing at least one charge component, a second chamber for containing an additional component, partition means separating said first chamber and said second chamber, closure means for confining said components within said first chamber and said second chamber, the combination with said body, said first chamber, said second chamber, said partition means and said closure means of percussion cap holding means, said percussion cap holding means being mounted on the underside of said closure means, said percussion cap holding means and a percussion cap held thereby being completely enclosed within the outermost confines of said body and said closure means when said closure means is in a closed position for protecting said percussion cap against contamination.

4,411,089

FISHING FLY WITH SYNTHETIC FEATHER

Ronald A. Runeric, 113 W. Moreland Ter., Akron, Ohio 44302

Continuation of Ser. No. 271,530, Jun. 8, 1981, abandoned. This application Jun. 14, 1982, Ser. No. 387,947
Int. Cl.³ A01K *85/08*
U.S. Cl. 43—42.53 **7 Claims**



1. The method of making a fishing fly incorporating a hook having a shank, a tail portion, a wing portion and a feather wherein said feather is formed of a plurality of synthetic fila-

ments arranged in spaced parallel relation and fastened in a row to a first thread, folding said filaments around said first thread to position said filaments on one side thereof, wrapping said first thread spirally around the shank of said hook so that said filaments extend radially from said shank.

4,411,090

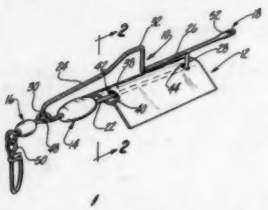
TROLLING PLANE

Ralph W. Seals, 5935 30th Ave. S., Gulf Port, Fla. 33707

Filed Feb. 19, 1982, Ser. No. 350,523

Int. Cl.³ A01K *95/00*

U.S. Cl. 43—43.13 **5 Claims**



1. In a trolling plane for submerging a fishing line, said plane being of the type comprising a wire frame having a support section extending fore and aft, said frame having a ramp section extending between a first bight at the forward end of the frame and a second bight located aft of the first bight, a ring on the ramp section of the wire frame for connection of a trolling line from a boat to the frame, said frame being adapted for connection of a fishing line thereto, a sinker mounted on said frame at a location forward of the second bight so that the frame assumes a diving attitude when the frame is suspended by the trolling line with the ring located at said second bight, and a hydrofoil mounted on the support section of said frame, the improvement wherein said hydrofoil has a central longitudinal axis extending fore and aft and is mounted on said support section for pivotal motion about its longitudinal axis relative to said frame.

4,411,091

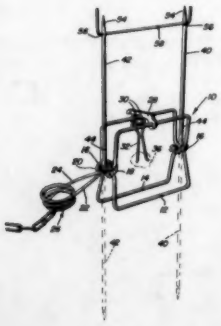
ANIMAL TRAP WITH SUPPORT-SUSPENSION LEGS

Dennis G. Hedstrom, Rte. 1, Box 114, Iron, Minn. 55751, and Rocky O. Hedstrom, Rte. 7, Box 646, Alexandria, Minn. 56308

Filed Jan. 8, 1981, Ser. No. 223,279

Int. Cl.³ A01M *23/26*

U.S. Cl. 43—88 **2 Claims**



1. A trap for suspension from an overhead support and, alternately for support from the ground in vertically spaced relation relative to the ground, said trap comprising a pair of levers, said levers including corresponding first base ends and second jaw ends, fastener means pivotally connecting said base ends together for relative swinging of said levers between first open positions with said jaw ends displaced away from each other and second closed positions with said jaw ends displaced toward each other into at least closely adjacent positions, spring means operatively connected between said levers yieldingly biasing the latter toward said second positions, releasable latch means operative to releasably latch said levers in said first positions, each of said levers including a generally U-shaped portion including a pair of parallel legs and a bight portion extending between and interconnecting one pair of corresponding base ends of said legs, said bight portions comprising said jaw ends of said levers, said fastener means comprising a pair of fasteners pivotally connecting the free ends of the legs of corresponding levers, a pair of elongated rigid support members each including a flattened end having a transverse aperture for said fastener means and a pointed tip end, said fastener means extending through said apertures of the flattened ends and pivotally supporting said flattened ends of said elongate support members for swinging of said elongated support members relative to both of said levers about the axes of relative pivoting of said levers and with said axes extending substantially at right angles relative to said flattened ends of said support members, said pointed tip ends of said elongated support members each including a transverse bore therein, the pointed tip ends being provided for impaling in the ground to provide suport from the ground, and means including a length of bendable wire adapted for passing through the transverse bores of the elongated support members providing for selective adjustability in suspension from a support structure.

4,411,092

FISH TRAP HAVING A CARDIOIDAL STRUCTURE

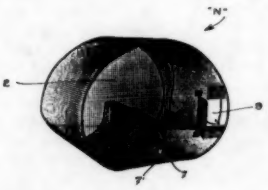
Louis-Marie Lalancette, 532 Judith Jasmin, Chicoutimi, Quebec, Canada G7H 6M8

Filed Jun. 9, 1981, Ser. No. 272,017

Claims priority, application Canada, Apr. 1, 1981, 374390

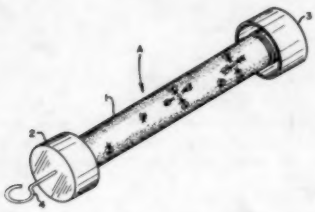
Int. Cl.³ A01K *69/08*

U.S. Cl. 43—100 **6 Claims**



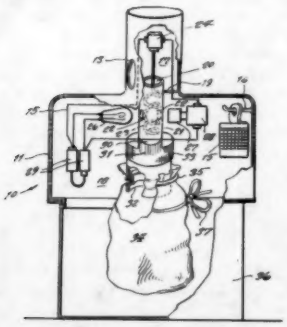
1. In a trap for catching small fishes of the type comprising a wire mesh basket provided with a central opening for allowing the fishes to enter the trap, the improvement wherein the basket has a cardioidal structure in order to reduce the possibilities for the fishes to escape from the trap, wherein the wire mesh basket comprises a cylindrical body with ends in the shape of a cardioid and a retrogressing zone extending along the whole height of the body, said retrogressing zone being flattened and comprising the opening of said basket in its middle portion and wherein the basket further comprises two flat wire mesh walls slantwisely mounted in the retrogressing zone from the central opening to the periphery of both ends of the cylindrical body respectively, said walls defining together with the body a funnel shaped opening extending in front of the central opening of the trap.

4,411,093
INSECT LURE
Daniel M. Stout, Kirkwood, Mo., and Charles B. Duff, Scottsdale, Ariz., assignors to Whitmire Research Laboratories, Inc., Kirkwood, Mo.
Filed Jun. 17, 1981, Ser. No. 274,551
Int. Cl.³ A01M 1/14
U.S. Cl. 43—114 22 Claims



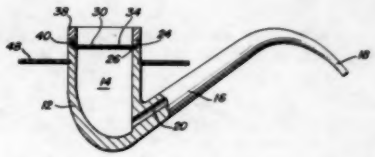
1. An insect lure for use in both attracting the insect to the lure from a distance and then terminating the life of the same after its adherence to the lure, comprising, a base member incorporating both the means for attracting and killing the insect, said base member having a superficial fluorescent attractant of luminescent material overprinted with silhouettes of insects for enhancing attraction of such insects to the lure, a coating of a highly viscous tackifier material for adhering the lure settled insect until its demise, said lure including a tubular base member, said tubular base member being formed as a wound tube, a light shade layer of paper applied over the base member to prevent the tube from color bleed therethrough, a wound layer of fluorescent paper forming the luminescent material applied over the light shade of paper, a coating of lacquer applied over the luminescent paper to function as tube barrier, and said tackifier coating being applied upon the lacquer barrier for enhancing insect adherence.

4,411,094
ELECTRONIC ROACH TRAP
Daniela Spackova, 300 W. 55th St., Apt. 14-S, New York, N.Y. 10019, and Richard M. Chen, 51-25 Goldsmith St., Elmhurst, N.Y. 11373
Filed Feb. 18, 1982, Ser. No. 350,117
Int. Cl.³ A01M 1/10
U.S. Cl. 43—121 2 Claims



1. An electronic roach trap, comprising in combination, a hollow housing removably placed on a container, an upper and lower compartment in said housing, a tube therebetween, entry openings for roaches into said upper compartment, a bait means in said lower compartment, and electric eye means for actuating a helical empeller to force said roaches down through said tube, and a sleeve therebelow holding a disposal bag.

4,411,095
BUBBLE PIPE
Wilford A. Rushing, and Barbara R. Rushing, both of Bloomington, Ill., assignors to Rosemary E. Boelke and Art Boelke, both of Charlotte, N.C.
Filed Feb. 5, 1982, Ser. No. 346,215
Int. Cl.³ A63H 33/28
U.S. Cl. 46—7 1 Claim



1. A bubble pipe device including an upwardly opening bowl and an elongated hollow stem having one end formed integrally with the lower end of the bowl and opening thereinto and the other end extending laterally outwardly from the bowl and adapted to be received in the mouth of a user, said bowl including an upper end internally threaded and enlarged annular portion defining an upwardly facing annular shoulder at the inner extremity thereof, a circular apertured insert plate removably received in said enlarged annular portion and seated on said shoulder, an externally threaded annular retaining member removably threaded into said enlarged annular portion above said plate and retaining the latter against removal from said enlarged annular portion, the threads in said enlarged annular portion extending upwardly through the upper periphery of said bowl and adapted, when said retaining member is removed, to facilitate the scraping of thin slivers of soap from a bar of soap scraped over the upper end of said bowl, said bowl including a peripheral groove formed in and extending about the exterior of said bowl, an apertured annular shield downwardly displaceable over the upper end of said bowl and removably snap fittingly engageable in said groove for retaining the down flow of soap bubbles exiting from the upper end of said bowl.

4,411,096
EDUCATIONAL TOY DOLL WITH WEIGHT TENDING TO RETURN HEAD
Samuel C. Smith, 210 Hartman Rd., Newton Centre, Mass. 02159
Filed Feb. 22, 1982, Ser. No. 351,114
Int. Cl.³ A63H 15/06
U.S. Cl. 46—155 8 Claims

1. An educational toy comprising a body having at least a generally erect portion, an elongated guideway extending downwardly on the body from the top of the generally erect portion, a head of generally circular cross-section separably mounted on the body and directed by the guideway, said head including a peripheral rib engaging said guideway, means for angularly orienting the head in a normal at rest position on top

of the generally erect portion and means including a weight positioned in the head for supplying a torque tending to return

the head to its at rest position after it has been rotated downwardly along the guideway.

4,411,097

DOLL WITH MOVABLE ARMS, LEGS AND HEAD ACCOMMODABLE WITHIN TRUNK

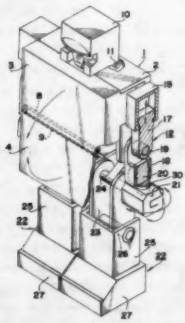
Katsuji Murakami, Tokyo, Japan, assignor to Kabushiki Kaisha POPY, Tokyo, Japan

Filed Sep. 16, 1981, Ser. No. 302,522

Claims priority, application Japan, Dec. 4, 1980, 55-174243[U]

Int. Cl.³ A63H *3/00, 3/46*

U.S. Cl. 46—161 **5 Claims**



1. A doll comprising a trunk defining a chest, addomen, back, waist and hips, and members simulating a head, shoulders, arms, hands, legs and feet,

said trunk being of a generally box shape,

having horizontally and centrally of the inner space a partition which defines an upper room and lower room within the trunk and fixedly connects at one upper edge thereof an upper lid on an upper hinge for pivotal movement in a vertical direction, and at a lower edge thereof a lower lid on a lower hinge for pivotal movement in a vertical direction, and

forming at the top an opening which is utilized when the head is accommodated within or emerged out of said upper room whereby the head in an emerged position locks to the upper edge portion of said upper lid, at the opposite side openings which are utilized when the shoulders, arms and hands are accommodated within or extended our of said upper room, and at the bottom an opening which is utilized when the legs and feet are accommodated within or extended out of said lower room whereby the feet in an accommodated position cover said opening at the bottom,

said head being rotatably moveable in a downward or upward vertical direction connected to an engaging pin mounted on said trunk within said upper room,

said shoulders respectively being fixed through a shoulder rod to a shoulder articulation which is rotatably connected to a shoulder articulating axle mounted on said trunk within said upper room, and

said legs respectively being pivotally journaled to a leg articulation axle mounted on said trunk within said inner room.

4,411,098

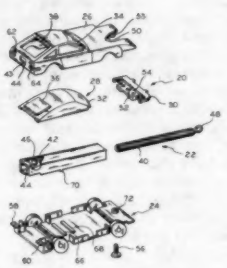
TOY VEHICLE

John D. Birdsall, 1262 Sunset Plz. Dr., Los Angeles, Calif. 90069; Ronald Liedtke, Addison, and Marvin Smollar, Northbrook, both of Ill., assignors to John D. Birdsall, Los Angeles, Calif.

Filed Dec. 11, 1981, Ser. No. 329,738

Int. Cl.³ A63H *17/00*

U.S. Cl. 46—206 **12 Claims**



1. A toy wheeled vehicle comprising a body having a key hole in the back area aligned with a tube inside the vehicle in a confronting relationship; an elongated coiled spring inside said tube; key means for linear insertion through said keyhole and into said tube; said key, keyhole, and tube being shaped to stabilize the positions of the key and coiled spring and to restrict key movement to a fixed orientation with only a substantially linear insertion and release motion; said key means comprising an elongated pair of spaced parallel plates joined on opposite ends having a handle on one end and a blade leading to a tip on the other end; latch means formed in the blade area on a side of at least one plate of said key to lock into mating keeper means formed on a confronting side of said tube; and spacer pin means positioned between said plates at a position intermediate said opposite ends which requires said side plates to flex in the area of said latch means when said plates are squeezed together.

4,411,099

SINGING ELECTRONIC FROG

Radames Cancel, 35-50 81st St., Apt. 2-K, Jackson Heights, N.Y. 11372

Filed Feb. 12, 1982, Ser. No. 348,220

Int. Cl.³ A63H *33/26*

U.S. Cl. 46—232 **3 Claims**

1. A singing electronic frog, comprising in combination, a base in the shape of a frog's hind legs, a body in the shape of an upper torso of a frog, said body being pivoted on said base, an electronic circuit in said frog including a sound producing system, means to open said circuit when said body is upwardly

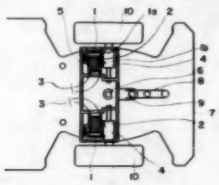
pivoted away from said base, force element means for biasing said body away from said base, and mating alined juxtaposed loop pile fastener elements secured to said body and said base for restraining said biasing force element means.

4,411,100

STEERING MECHANISM FOR RUNNING TOY

Yoshio Suimon, Nakajima Daiichi Bldg. No. 24-2, Yotsuga 4-chome, Shinjuku-ku Tokyo, Japan

Filed Dec. 28, 1981, Ser. No. 334,962
Int. Cl.³ A63H *17/36*
U.S. Cl. 46—235 **4 Claims**



1. Steering mechanism for toy vehicles and the like having a chassis, comprising a sealed boxlike housing, means pivotally mounting said housing on said chassis for movement relatively thereto about a vertical axis, a pair of wheels for said vehicle, means rotatably supporting said wheels on individual shafts formed of magnetic material positioned within opposite transverse ends of said housing, a pair of soft magnetic members mounted within said housing for movement toward and away from said respective shafts, a pair of energizeable coils so positioned within said housing and about a portion of each soft magnetic member, that energization of one or the other of said coils will drive the corresponding magnetic member into frictional contact with its adjacent shaft to cause a braking action on the attached wheel and rotation of said housing on said chassis to effect a steering action of the vehicle, and means restoring said housing to a normal position relative to said chassis upon deenergization of the energized coil.

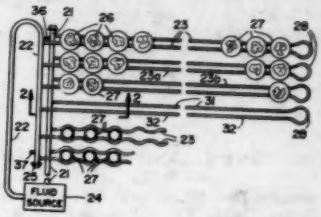
4,411,101

APPARATUS AND METHOD FOR HEATING THE ROOT ZONE OF PLANTS

Edward A. Springer, and Ronald D. Smith, 611 Mountain View Ave., both of Petaluma, Calif. 94952

Filed Aug. 17, 1981, Ser. No. 293,681
Int. Cl.³ A01G *13/00*
U.S. Cl. 47—2 **1 Claim**

1. Apparatus for root zone heating of plants comprising:
input manifold means, outlet manifold means, and an array of fluid conveying heating tubes each coupled to said input manifold means and said outlet manifold means for the flow of a heating fluid therethrough,
said tubes being substantially cylindrical and being formed of a flexible self-supporting elastomeric terpolymer of ethylene, propylene and diene monomer,
adjacent tubes in said array being relatively spaced apart by a distance between about 2.5 centimeters and about 7.6 centimeters over substantially the entire lengths of said tubes and said tubes being positioned adjacent to growing plants,
said tubes being independently movable over substantially the entire lengths thereof, and



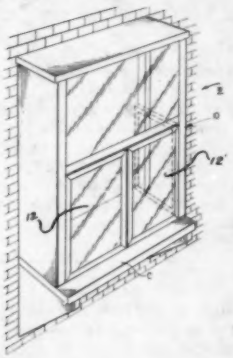
at least some of said tubes in said array being displaced from said array to a position above said array to provide for heating of the air space proximate said plants.

4,411,102

DOOR CONTROL

John R. Radek, Hinsdale, Ill., assignor to Ready Metal Manufacturing Company, Chicago, Ill.

Filed Aug. 20, 1980, Ser. No. 179,961
Int. Cl.³ E05F *17/00*
U.S. Cl. 49—110 **4 Claims**



1. In combination with an inclosure having a horizontal shelf and a passage thereabove normally disposed between a clerk on one side and a customer on the other for transaction of business, a pair of swinging doors lying in a common vertical plane normally closing said passage, said doors having adjacent substantially meeting edges when closed and a vertical actuating rod mounted for axial rotation adjacent the edge of each door remote from said adjacent edges, and means for simultaneously opening and closing said doors, comprising,
(a) a reciprocable carriage below said shelf and a horizontal, spring-biased actuator therefor with analogous mechanisms between said carriage and said actuator for swinging said doors simultaneously from closed position to their open positions in opposed planes approximately 90° from the plane of their closed position,
(b) each of said mechanisms comprising a bell-crank lever having a fixed pivotal fulcrum and pivots on opposite sides of said fulcrum,
(c) first linkage means extending between said carriage and one of said pivots,
(d) second linkage means extending between the other of

said pivots and the respective rod and keyed to the lower end thereof for rotation of the rod on its axis,

(e) a crank arm keyed to the upper end of said rod and pivotally mounted to the upper edge of said door intermediate the vertical edges thereof,

(f) a guide roller mounted on the upper edge of the door intermediate the vertical edges thereof,

(g) guide means for said roller above the door and in the plane of the doors when in closed position, and

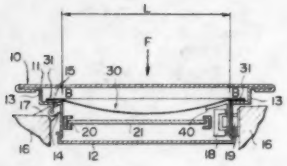
(h) means for automatically actuating said carriage reversely to effect simultaneous closing of the doors.

4,411,103

CONSTRUCTION OF A DOOR BEAM OF A MOTOR VEHICLE

Eiichi Ohmura, and Tateo Kitano, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed May 18, 1981, Ser. No. 264,560
Claims priority, application Japan, May 29, 1980, 55-71989
Int. Cl.³ B60J *5/04*; E06B *3/00*
U.S. Cl. 49—502 **9 Claims**



1. A vehicle door construction having a pair of side panels comprising:

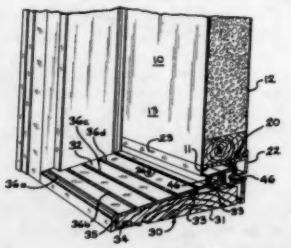
a door beam fixed to the door side panels at opposite ends of said door beam, said door beam being of an arcuate shape in plan view, said door beam being further configured such that the section modulus of said door beam is a maximum at a center section of said door beam and gradually decreases toward both opposite ends of said door beam, the contour of cross section of said door beam being of round wave shape.

4,411,104

INSWING DOOR BOTTOM AND SILL ASSEMBLY

William R. St. Aubin, Wood, Ohio, assignor to LST Corporation, Sylvania, Ohio

Continuation of Ser. No. 205,914, Nov. 12, 1980, abandoned.
This application Dec. 30, 1982, Ser. No. 454,737
Int. Cl.³ E06B *1/70*
U.S. Cl. 49—470 **10 Claims**



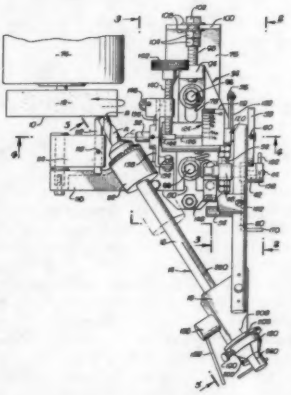
1. An improved bottom and sill assembly for mounting on exterior doors comprising; a bottom assembly for mounting on such door, said bottom assembly having a flexible and generally tubular sealing member extending along the inner edge of such door and projecting downwardly, said sealing member having a flexible and deflectable exterior wall spaced from an inside wall, a sill assembly positioned below and in mating relationship with said bottom assembly when such door is in a closed position, said sill assembly defining a horizontally extending projection adjacent the inner edge of such door which engages and deflects said sealing member when said door is closed to provide a weather-impervious barrier, said sealing member extending downwardly to an elevation below said horizontally extending projection, said horizontally extending projection deflecting said flexible and deflectable exterior wall inwardly from a first shape to a second shape along the entire horizontally extending projection when the door is closed, whereby a continuous seal is formed and maintained which wraps the horizontally extending projection on both its horizontal and vertical edges even when the door and sill are misaligned.

4,411,105

PRECISION DRILL BIT RESURFACING TOOL

Antti P. Raiha, Rte. #1, Box 512, Sandpoint, Id. 83864

Filed Jul. 23, 1981, Ser. No. 286,334
Int. Cl.³ B24B *3/28*
U.S. Cl. 51—124 R **9 Claims**



1. In a surfacing tool for a multiple lipped drill bit cooperable with a surface of a grinding wheel,

(a) a holder for the drill bit to be surfaced;

(b) a pivot block;

(c) means mounting the holder on the pivot block for movement about a swing axis;

(d) means mounting the pivot block for movement in a path which orients the swing axis substantially parallel to the operative surface of the grinding wheel, movement of said pivot block in its said path moving said swing axis towards and away from said operative surface;

(e) means forming a stop for limiting movement of said pivot block in its said path;

(f) means urging said pivot block normally to engage said stop;

(g) means movably mounting the stop for determining a starting position of the stop and a corresponding position of the swing axis in accordance with the size of the drill bit to be surfaced;

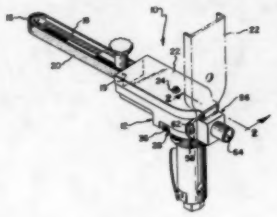
(h) feed means mounted on the stop for micrometric work stroke movement of the pivot block and the drill bit holder mounted thereon; and

(i) marker means for providing a memory as to the excursion of said feed means so that said excursion can be exactly duplicated for all drill bit lips.

4,411,106
MINIATURE BELT GRINDER

Elwin H. Fleckenstein, Alden, and Walter N. Welsch, Tonawanda, both of N.Y., assignors to Dynabrade, Inc., Tonawanda, N.Y.

Filed Aug. 28, 1980, Ser. No. 181,969
Int. Cl.³ B24B 23/06, 55/06
U.S. Cl. 51—170 EB 8 Claims



1. In a belt grinder having a casing, a drive pulley rotatably supported within the interior of said casing by a drive shaft of a pneumatic motor, a contact pulley spaced from said drive pulley and supported for rotation by an arm assembly projecting through a forward opening of said casing, and an endless belt trained about said pulleys, said motor having a housing secured to said casing and surrounding said shaft, the improvement, comprising:

passage means for venting exhaust air from said motor housing;

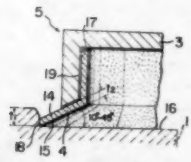
an exhaust passage in communication with said interior of said casing; and

restricted exhaust passage means in communication with said passage means and said exhaust passage for generating therethrough high velocity flow of exhaust air from said motor housing to said exhaust passage to induce a flow of ambient air through said casing opening and said interior of the casing through said exhaust passage for the removal of dust, grit or debris therefrom, said restricted exhaust passage means comprises an annular nozzle adjacent said exhaust passage, and said passage means includes an annular chamber in surrounding relation to said annular nozzle.

4,411,107
GRINDING WHEEL FOR FLAT PLATES

Shinji Sekiya, Tokyo, and Takatoshi Ono, Nagareyama, both of Japan, assignors to Disco Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1980, Ser. No. 212,305
Claims priority, application Japan, Feb. 1, 1980, 55-10888; Feb. 1, 1980, 55-10889
Int. Cl.³ B24D 5/00
U.S. Cl. 51—209 R 9 Claims



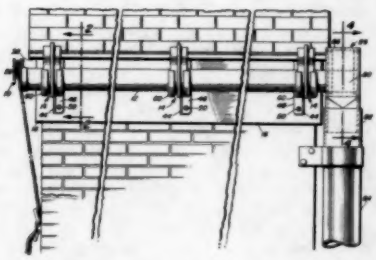
1. A grinding wheel for grinding the surface of flat plates comprising a cup rotatable about an axis perpendicular to the flat plate surface to be ground and having an open end for facing toward said flat plate surface and comprising a substantially cylindrical sidewall having interior and exterior peripheral surfaces;

a grindstone which is an inverted, funnel-shaped, thin wall monolithic element having an axially elongate cylindrical mounting portion extending substantially throughout its length from the open end of said cup close along the cylindrical side wall of the cup and being telescoped with respect to said cup and means for affixing said cylindrical mounting portion to said cup, said grindstone consisting of a self-supporting thin layer of uniform thickness fixed to said cup without an electrodeposition substrate, said grindstone comprising a uniformly thin one-piece annular frusto-conical brim of grinding material having a central peripheral portion integrally extending from the end of the cylindrical mounting portion at the open end of the cup and which like a somewhat drooping hat brim angles cantilevered outwardly beyond the cylindrical mounting portion of the grindstone while angling away in a separated manner from the open cup end at an angle of from 100° to 135° to the axis of rotation of said cup, said brim of grinding material being circumferentially continuous, said brim protruding from said cylindrical mounting portion of the grindstone to a width of about 5 mm and having a thickness in the range of 0.1 mm to 0.5 mm, the axial length of said cylindrical mounting portion being substantially equivalent to the width of said brim, said brim and cylindrical mounting portion respectively forming the mouth and neck of an inverted funnel such that the outer peripheral edge of the brim is the sole part contactable with a flat plate surface to be ground and the full width of the brim of grinding material separates the open cup end from contact with the plate, said thin frusto-conical brim being of electrodeposited nickel metal having dispersed therein grains of a crystalline material.

4,411,108
GUTTER SYSTEM

Thomas P. Kerester, 1305 Kingston Ave., Alexandria, Va. 22302

Filed Jul. 8, 1981, Ser. No. 281,383
Int. Cl.³ E04D 13/06
U.S. Cl. 52—11 23 Claims



1. A support for a system for rotatably supporting a gutter comprising:

a support bracket for attachment to a building, said bracket having a curvilinear bearing surface;

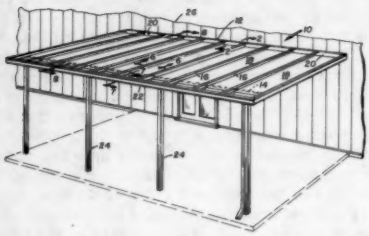
a support member for attachment to a gutter, said support member being movably held by said support bracket; and

a plurality of discrete roller elements rotatably carried by one of said support brackets and said support member for rolling contact between said support member and said support bracket whereby said support member is movable relative to said bracket to rotate a gutter for the removal of debris.

4,411,109
BEAM-BRACED AWNING

Francis L. Struben, and Jean C. Struben, both of 3870 Jarrettsville Pike, Jarrettsville, Md. 21084

Filed Sep. 18, 1981, Ser. No. 303,376
Int. Cl.[3] E04D *13/00*; E04B *7/04*; E04D *13/04*
U.S. Cl. 52—11 9 Claims



1. An awning, comprising:

a wall support means, said wall support means being substantially channel-like in configuration, said channel-like wall support means having a web and top and bottom flanges, said channel-like wall support means being suitably affixed to a wall through said web, said web being reinforced by increased thickness at the lowermost portion thereof, said top and bottom flanges being canted downwardly from said web, said top flange having a first and second downwardly projecting protrusions, said first downwardly projecting protrusion being located at the distal end of said top flange, said second downwardly projecting protrusion being longer than and spaced apart from said first downwardly projecting protrusion, said downwardly projecting protrusions extending the entire length of said wall support means, said spaced apart protrusions forming a pocket means thereby;

an outboard support means;

a plurality of beam means, said plurality of beam means being spaced apart and supported by and suitably affixed in place to said wall support means and said outboard support means, said plurality of beam means each being generally of an "I" configuration, said "I" configuration consisting of a vertical web and a top and bottom flange, each said beam means having two downwardly projecting protrusions, one of said two protrusions being located on each side of and spaced from said web of said beam means, thereby forming a pocket means on each side of said web, said downwardly projecting protrusions being flanged outwardly at the tips thereof, said downwardly projecting protrusions extending the entire length of said beam means;

a plurality of roof cover means, each said roof cover means of said plurality of roof cover means being partially inserted into said pocket means of each said beam means and then suitably affixed to the respective beam means;

a plurality of rigid sealing means, each said rigid sealing means of said plurality of rigid sealing means being partially inserted into said pocket means formed by said downwardly projecting protrusions of said wall support means and suitably affixed into place; and

a combined rain gutter and face plate means, said combined rain gutter and face plate means being suitably affixed to the outboard ends of said plurality of said beam means.

4,411,110
RAIN GUTTER

Robert J. Carey, 478 Leonardville Rd., P.O. Box 68, Belford, N.J. 00718

Filed Nov. 9, 1981, Ser. No. 319,385
Int. Cl.[3] E04D *13/06, 13/08*
U.S. Cl. 52—11 9 Claims

1. An improved rain gutter for preventing entrance thereinto of leaves and other debris which cause rain gutter clogging and the stoppage of rain flow into downspouts, the improved rain gutter for being attached to a building adjacent the edge of a roof upon which rain falls, comprising:

generally closed longitudinally extending hollow rain gutter means including a front;

said front provided with a plurality of longitudinally extending, generally horizontally disposed, rows of interrupted slots, the interruptions between the slots in each row being displaced horizontally with respect to the interruptions between the slots of the next adjacent row of slots such that there is no generally vertical path of rainflow down said front which is not interrupted by at least one of said slots;

said front provided with a plurality of generally inwardly and downwardly extending flaps;

said flaps provided along the top edges of said slots for receiving rain flowing across said front and for diverting said rain into said hollow rain gutter means; and

said slots being of a predetermined size sufficiently small to generally prevent the entrance thereinto, and into said hollow rain gutter means, of said leaves and other debris.

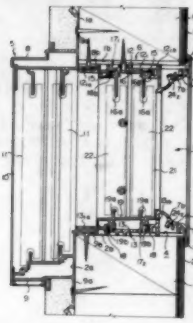
4,411,111
WINDOW SASH ASSEMBLY

Shuichi Hosooka, Namerikawa, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Oct. 29, 1980, Ser. No. 201,696
Claims priority, application Japan, Nov. 13, 1979, 54-156461[U]
Int. Cl.[3] E06B *1/04*
U.S. Cl. 52—213 3 Claims

1. A window sash assembly for installation in a building window opening which comprises an outer metal sash, an inner sash positioned and assembled indoors adjacent to said outer sash and a peripheral edge member positioned about the inner end of said inner sash to cover the adjacent open end of an indoor wall member, characterized in that said inner sash includes a main portion of adiabatic material which is integrally formed with said peripheral edge member at the inner end portion thereof and forms a sash main frame composed of similar upper, lower, right-hand, and left-hand frame members and extending from said peripheral edge member to the indoor pieces of said outer sash and metal upper and lower rail frames and metal left-hand ad right-hand door boxing frames being disposed along the inner periphery of said sash main frame, said sash main frame being formed into a first framework and

said upper and lower rail frames and left-hand and right-hand door boxing frames being formd into a further framework, said further framework being separately mounted within and con-



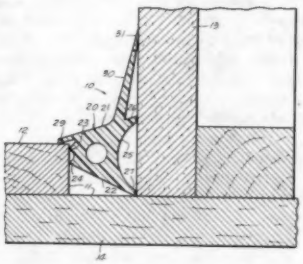
nected to said first framework to form a one-piece framework assembly which is fitted as a unit in said building window opening.

4,411,112

SEALING STRIP FOR AN EXPANSION VOID

Neil S. Golden, Los Angeles, Calif., assignor to Albert H. Allen, Beverly Hills, Calif., a part interest

Filed Oct. 27, 1981, Ser. No. 315,708
Int. Cl.³ E04B 7/00
U.S. Cl. 52—288 **8 Claims**



1. A strip for sealing an expansion void between the floor and a room wall comprising:

an elongated extruded strip of resilient material of uniform cross section having upper and lower surfaces converging toward one another from a relatively wide wall-engaging lateral side thereof;

said wall-engaging side of said strip being recessed and provided with upper and lower ribs extending lengthwise thereof, said upper rib being adapted to seat firmly against the wall adjacent the top of said void and said lower rib being adapted to seat firmly against the wall adjacent the bottom of said void;

the opposite relatively narrow lateral side of said strip being provided with at least one rib adapted to seat firmly against the edge of the floor side of said expansion void adjacent but below the upper surface of the floor; and

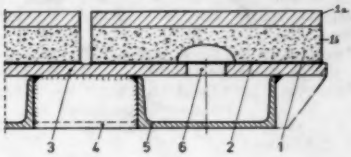
said ribs along the opposite lateral sides of said strip being adapted to cooperate with one another in providing a self-stabilizing generally triangular anchorage effective to lock said strip firmly assembled in said expansion void.

4,411,113

PREFABRICATED AERATION BLOCK FOR SILO BASES

Wilhelm Zimmermann, Hamburg, Fed. Rep. of Germany, assignor to Claudius Peters AG, Fed. Rep. of Germany

Filed Mar. 19, 1981, Ser. No. 245,457
Claims priority, application Fed. Rep. of Germany, Mar. 21, 1980, 8007813[U]
Int. Cl.³ E04B 1/70
U.S. Cl. 52—303 **4 Claims**



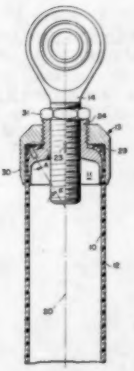
1. A prefabricated aeration units in a silo bases wherein said silo base is constructed of a plurality of such units comprising, a flat plate having a top side and a bottom side with a plurality of air connecting bores therethrough, a plurality of porous aeration blocks adherently affixed to the top side of the flat plate essentially centrally over said air connecting bores, transversely open shaped manifold air distribution support sections on the bottom side of the flat plate having side walls, the said side walls of the transversely open shaped manifold support sections being fixed to the plate, said units being adapted and constructed whereby a plurality may be disposed to be positioned along a bottom of a silo.

4,411,114

COMPRESSION-TENSION STRUT

Horst Wurtinger, Fürstenfeldbruck; Jochen Glissmann, Dachau, and Herbert Heissler, Munich, all of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Dec. 29, 1980, Ser. No. 221,335
Int. Cl.³ E04L 3/30
U.S. Cl. 52—309.1 **10 Claims**



1. A strut for longitudinal tension and longitudinal compression comprising a tubular wrapping from reinforcing fibers in a synthetic resin on a core, with respectively one rounded cap provided at each end and exhibiting a central outer peg, the wrapping terminating on the rounded portion of this cap, the latter serving as a tension cap, and with respectively one compression cap attached to the outer peg and surrounding the rounded section of the wrapping, the wrapping of the strut exhibits longitudinal fibers extended over the two rounded

portions around pins fixedly provided on the rounded portions and oriented obliquely toward the outside; and the core being a pipe of a fiber-reinforced synthetic resin and respectively affixed to an inner peg of the tension cap, for the concomitant absorption of the longitudinal compression or of the longitudinal compression and longitudinal tension.

4,411,115

SPACER FRAMES FOR MULTI-PANE GLAZING UNITS

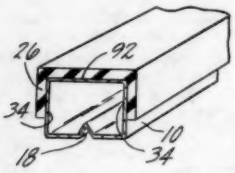
Taieb Marzouki, and Bernd Schweisser, both of Taunus, Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

Division of Ser. No. 26,064, Apr. 2, 1979, Pat. No. 4,294,733. This application Jun. 10, 1981, Ser. No. 272,276

The portion of the term of this patent subsequent to Oct. 13, 1998, has been disclaimed.

Int. Cl.³ E04B *1/62*

U.S. Cl. 52—309.1 **6 Claims**



1. A spacer frame suitable for use in assembly of multiple pane units, comprising spacer elements in the form of a closed figure having, adhered on a selected bonding surface(s) a coating of a heat softenable elastic sealant composition which is shape-retaining and non-tacky at temperatures below 60° C. and capable of softening to bond-forming condition when heated to temperatures above 140° C. and which comprises a block copolymer having two polystyrene end blocks linked to an at least substantially saturated polyolefin rubber mid-block, an aliphatic hydrocarbon resin of melting point not less than 60° C., an epoxy resin, and finely divided inorganic filler.

4,411,116

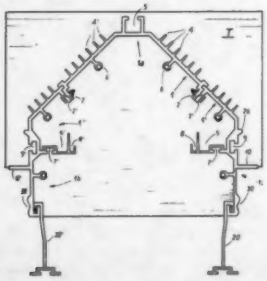
MULTIPLE-USE CHANNEL-SHAPED STRUCTURE FOR SUSPENDED CEILING

Laurent Maillard, Milan, and Graziano Bregolin, Pavia, both of Italy, assignors to Thermosystem S.p.A., Italy

Filed Apr. 20, 1982, Ser. No. 370,031

Int. Cl.³ E04B *5/55*

U.S. Cl. 52—489 **5 Claims**



1. A multiple-use channel-shaped structure for false ceilings to be fixed at the ends to a pair of head plates, in particular for supporting absolute filters, which is channel-shaped, elongated and uninterrupted, adapted to be mounted to the ceiling with the channel-shaped concavity in the downward direction by means of a central continuous slot, further comprising outer cooling fins and outer recesses for the connection with cross spacer members; inner grooves for coupling with said head plates; supporting inner recesses and beads; and outer brackets for supporting said absolute filters.

4,411,117

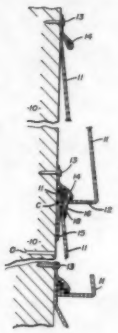
BUILDING SIDING REPLACEMENT DEVICE AND METHOD

David J. Bolha, 939 S. Schenley Ave., Youngstown, Ohio 44509

Filed May 20, 1981, Ser. No. 265,382

Int. Cl.³ E04C *1/34*; E02D *37/00*; E04D *1/00*; E04G *23/02*

U.S. Cl. 52—521 **6 Claims**



1. A method of removing and reinstalling building siding comprising the steps of cutting a first section of siding to be removed immediately below the lower marginal edge of a second section of siding, moving the first section of siding downwardly so as to uncouple the overlapped lower edge of said first section of siding from a third section of siding, removing the first section of siding from the associated building, positioning a clamping strip having a hook shaped flange thereon partially between the remaining portion of the first section of siding and the lower marginal edge of the second section of siding, reinstalling said second section of siding by placing the free severed upper edge portion thereof between said clamping strip and the hook shaped flange thereon and re-engaging the lower edge of said first section of siding on said third section of siding.

4,411,118

PANEL SET FOR THE FORMATION OF ATHERMANOUS WALLS

Jorge C. Claver, Provenza 474, Barcelona, Spain

Filed Apr. 17, 1981, Ser. No. 255,041

Claims priority, application Spain, Apr. 30, 1980, 250.369[U]

Int. Cl.³ E04C *1/10*

U.S. Cl. 52—582 **9 Claims**

1. A panel set for the formation of athermanous walls comprising:

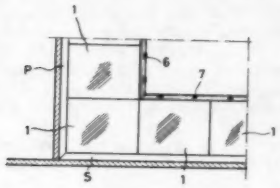
(a) panels for forming an anthermanous wall, each panel being formed for two rigid lateral, substantially sheet-like members and a central core of insulating plastics material between the sheet-like members, and having edges juxtaposable to corresponding edges of another panel; and

(b) coupling means fixedly connected to said panels for juxtaposably coupling one panel to another panel and including:

(i) a male mating element fixedly attached to a panel at an edge thereof and having an outwardly extending active member with at least one flank lateral surface inwardly

tapered toward the panel edge to which said male mating element is attached;

(ii) a female mating element fixedly attached to a panel at an edge thereof and having an inwardly extending active member with an inlet opening adapted to receive insertion of the active male member of another panel when the panels are juxtaposed together at respective edges thereof; and



(iii) an adjustable resilient retractable stop means positioned in said female mating element for allowing insertion of said male active member and having a generally frustoconical end for engaging said inwardly tapered flank lateral surface of said male active member upon insertion and tightening the juxtaposed panels closer together at the respective edges thereof.

4,411,119

METHOD OF LAYING BRICK FOR SWIMMING POOL PATIOS AND THE LIKE

Richard L. Miller, 233 Broadway, Room 3612, New York, N.Y. 10007

Filed Nov. 17, 1980, Ser. No. 207,765
Int. Cl.³ E04H *3/16*
U.S. Cl. 52—747 **3 Claims**

1. A method of laying a brick surface around an area, which comprises:

laying at least one continuous concentric row of brick around said area, said laying including starting said row of brick with a pointed wedge-shaped brick followed by a plurality of progressively tapered bricks until the last of said tapered bricks attains a width equal to the width of standard conventional bricks, said standard bricks being then used to complete the laying process, whereby a brick surface by way of laying at least one continuous row of brick can be laid without cutting and fitting, wherein said area is an approximately horizontal area, said area being a swimming pool.

4,411,120

ALUMINUM SHINGLE ACCESORIES

Billy H. Ellis, No. 4 Edgehill Rd., Joshua, Tex. 76058, and Randall Ellis, 7505 Ridgeway, Fort Worth, Tex. 76180

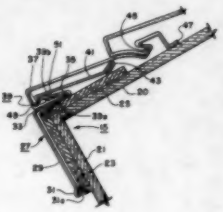
Filed May 4, 1981, Ser. No. 260,001
Int. Cl.³ E04B *7/00*
U.S. Cl. 52—748 **4 Claims**

1. A method of installing metal shingles to roof decking at an eave and gable end, each of the shingles being of the type having a lower forwardly projecting flange for engaging an interlocking slot of another shingle, comprising:

providing an accessory with first and second flat portions bent to form a corner, each flat portion having a free edge, the accessory further having a channel formed between the second flat portion and the corner;

securing one of the accessories to an eave to serve as a starter strip, with the channel and second flat portion extending forwardly above the roof decking, and with the first flat portion depending downwardly to serve as a drip edge;

securing a first row shingle to the roof decking with its flange inserted into the channel;



securing another one of the accessories to the gable end to serve as a gable strip, with its channel and second flat portion located outside the decking and extending downwardly, to serve as a drip edge, the first flat portion extending above the roof decking; and

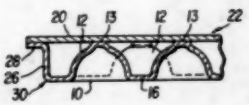
bending the sides of the shingles next to the gable end downwardly and inserting the sides into the channel.

4,411,121

STRUCTURAL MEMBER WITH TRUNCATED CONICAL PORTION AND COMPOSITE PANEL INCLUDING SAME

Peter A. Blacklin, Columbia; James R. Dougherty; Richard J. Johnson, both of Baltimore, and Donald L. Tate, Millersville, all of Md., assignors to Tate Architectural Products, Inc., Jessup, Md.

Filed Feb. 2, 1981, Ser. No. 230,671
Int. Cl.³ E04C *2/32*
U.S. Cl. 52—792 **20 Claims**



1. A sheet of structural material comprising:

a pattern of dome-like projections extending from the plane of said sheet and of which at least a major portion of the configuration of each dome-like projection is circular in plan view, said dome-like projections in the plane of said sheet being arranged in a geometric pattern that substantially limits the elongation of the material to the areas defined by the substantially circular configurations,

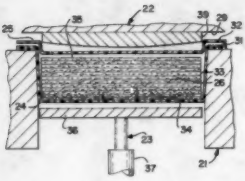
at least one of said dome-like projections further comprising a truncated cone portion formed in a peak area thereof having a flattened uppermost planar surface parallel to the plane of said sheet, thereby increasing overall depth and resistance to crushing.

4,411,122

APPARATUS AND METHOD FOR PRESSURE RESIZING OF PRODUCTS

Darrel G. Cornish, McFarland, and Carroll P. Hartl, Madison, both of Wis., assignors to Oscar Mayer & Co., Inc., Madison, Wis.

Filed May 23, 1980, Ser. No. 152,759
Int. Cl.³ B65B *1/24, 55/00, 63/02*
U.S. Cl. 53—436 **23 Claims**



1. An apparatus for pressure resizing a product into substantial conformity with the inside surface of a preformed package having a body member including a side wall and an end wall, the package also having a closure panel opposite the end wall, the product being arranged in the form of a mass having a side surface, an end surface and a closure surface opposite the end surface, the apparatus comprising:

a pressure resizing cavity resilient having a side wall restraint member that is of substantially the same size and shape as the side wall of the body member of the package, there being substantially no gaps between the side wall restraint member and the package body member side wall;

a closure end restraint member positioned with respect to the cavity to contact and to apply force to substantially the entire closure surface of the product; and

pressure generating means for imparting a force to the end surface of the product, said pressure generating means including a surface, there being substantially no gaps between said surface of the pressure generating means and the package body member end wall;

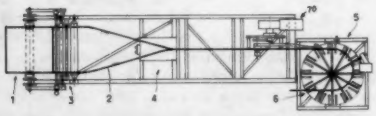
whereby the side wall restraint member, closure end restraint member and pressure generating means combine to resize the product by a restrained cavity concept to conform substantially to the size and configuration of the cavity.

4,411,123

PACKAGING APPARATUS

Raoul L. A. Gautier, Belmont sur Vair, France, assignor to Societe Generale des Eaux Minerales de Vittel, Vittel, France

Filed Nov. 25, 1980, Ser. No. 210,364
Claims priority, application France, Sep. 6, 1980, 80 13039
Int. Cl.³ B65B *9/08*
U.S. Cl. 53—550 **13 Claims**



1. Packaging apparatus for forming a connected series of containers from an elongated strip of film and for disposing materials in each of said containers, said apparatus comprising:

(a) a supply of the elongated strip of film;

(b) means for withdrawing the film from said supply and for advancing the film along a path;

(c) means disposed at a first station adjacent said path for operating upon and for forming the film into the series of connected containers;

(d) means disposed at a second station along said path downstream of said first station for injecting material at periodic intervals into a single one of the series of containers as it is brought one at a time to said second station, said injecting means comprising opening means for engaging the film that is brought to said second station and for effecting an opening in each container whereby said injecting means may inject materials into each container as it is disposed at said second station, whereby the length of the elongated strip is decreased;

(e) means for imparting a relatively stationary relationship between each container of the series and said material injecting means, thereby permitting the injection of materials by said material injecting means into each of said containers of the series; wherein said imparting means comprises a carousel, motor means for providing a rotational movement to said carousel, and said opening means comprises a plurality of holding means, each spaced at given intervals about the periphery of said carousel, each of said holding means for receiving and holding one of the containers of the series; and

(f) strip length compensating means responsive to the advancement of the strip along said path for disposing the containers of the series closer together while being filled with material by said injecting means wherein said strip length compensating means comprises a plurality of positioning adjusting means, each coupled to a corresponding holding means and operative in response to the rotation of said carousel for disposing its corresponding holding means along a radial path towards the axis of said carousel, whereby successive containers of the strip are spaced closer together after they have been filled with material by said injecting means.

4,411,124

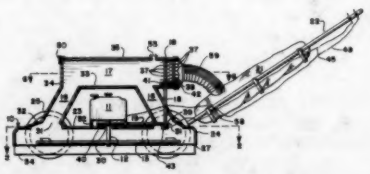
Patent Not Issued For This Number

4,411,125

MULTI-FUNCTION APPARATUS FOR LAWN MAINTENANCE

Hubert E. Strickland, 1108 Wright Ave., Chesapeake, Va. 23324

Filed May 17, 1982, Ser. No. 378,725
Int. Cl.³ A01D *53/00, 53/08*
U.S. Cl. 56—16.9 **3 Claims**



1. A lawn maintenance apparatus comprising:

(a) a housing open at the bottom and comprised of a substantially horizontally disposed deck and peripherally disposed sidewall, and provided with four wheels for rolling

support, said deck containing a central aperture and four arcuate apertures spaced 90° apart in a circular locus about said central aperture,

(b) an engine mounted atop said deck and equipped with a drive shaft which is downwardly directed from said engine and penetrates said central aperture,

(c) a cutting blade mounted upon said drive shaft, disposed below said engine within said housing and adapted for rotation in a horizontal plane, said cutting blade having four extremities arranged in a cross design, each extremity having an upwardly angled portion positioned to pass below said arcuate apertures,

(d) ducting means communicating with said arcuate apertures for upwardly conveying lawn debris,

(e) a collector box positioned above said engine and in communication with said ducting means,

(f) means driven by said engine for mulching said debris, said means comprising a series of counter-rotating intermeshing circular discs mounted upon two rods positioned within said collector box,

(g) a removable porous container adapted to collect said mulched debris, and

(h) handle means pivotably associated with said housing.

4,411,126

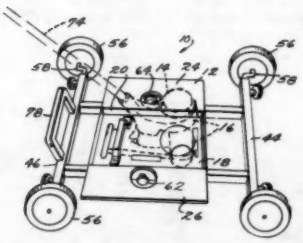
CARRIAGE FOR A GRASS TRIMMING DEVICE

Joseph M. Lowry, 308 Sweetbriar Dr., and Ernest E. Griffin, 12306 Ridgefield Pkwy., both of Richmond, Va. 23233

Filed Feb. 26, 1982, Ser. No. 353,002

Int. Cl.³ A016 *3/06*

U.S. Cl. 56—17.5 **8 Claims**



1. A carriage for a trimming device of the type having a motor, a housing for the motor, a cutting element in the form of a length of cable connected to said motor so as to be rotatable about an axis at high speed for cutting grass, weeds and the like, said carriage comprising:

a platform having a top and a bottom side, an aperture in said platform for receiving and supporting the motor driven trimming device with the cutting element located on said bottom side and the housing located on the top side thereof, said platform having releasable clamping means for holding the trimming device thereon,

frame means for supporting said platform, said frame means having front and rear ground engaging wheel means spaced apart a selected distance on said frame means, said frame means including a pair of substantially parallel arms extending between said front and rear wheel means and spaced apart a selected distance, said platform having a pair of substantially parallel guide wall means spaced apart a distance slightly less than said selected distance so that said pair of guide wall means is disposable between said parallel arms of said frame means and slidable with said platform with respect to said arms over at least a said portion of said selected distance toward and away from said front wheel means, releasable gripping means for securing said platform on said frame means in a selected position between said front and rear wheel means.

4,411,127

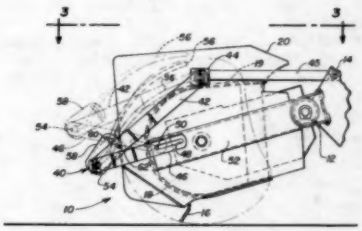
FLOATING WINDGUARD

Anthony F. Diederich, Jr., Terre Hill; Peter P. Haldeman, Reinholds, and Willis R. Campbell, Ephrata, all of Pa., assignors to Sperry Corporation, New Holland, Pa.

Filed Apr. 5, 1982, Ser. No. 365,704

Int. Cl.³ A01D *89/00*

U.S. Cl. 56—364 **8 Claims**



1. A windguard for use on a pick-up mechanism attachable to the frame of a crop harvesting machine, said windguard comprising:

(a) a bar extending transversely of said pick-up mechanism;

(b) a plurality of tines attached to said bar along the length thereof;

(c) said bar being movable in a first direction upward and away from said pick-up mechanism and in a second direction downward and toward said pick-up mechanism during operation of said pick-up mechanism;

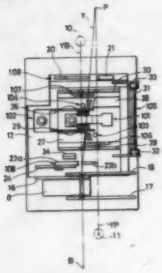
(d) link means supporting sid bar, said link means being pivotable in one direction to move said bar in said first direction and in the opposite direction to move said bar in said second direction; and

(e) said bar being rotatably connected to said link means.

4,411,128
METHOD AND APPARATUS FOR SPLICING SPUN YARNS

Hiroshi Mima, Joyo, Japan, assignor to Murata Kikai Kabushiki Kaisha, Japan

Filed Sep. 23, 1981, Ser. No. 304,848
Claims priority, application Japan, Sep. 26, 1980, 55-134986
Int. Cl.³ D01H 15/00
U.S. Cl. 57—22 9 Claims



1. A method for splicing spun yarns in an automatic winder by sucking yarn ends on both the bobbin and package side into yarn end control nozzles respectively, inserting yarn ends into a yarn splicing nozzle and being subjected to an air jet to splice them in the yarn splicing nozzle, characterized in that the sucking action of the yarn end control nozzle is stopped when or after the treatment of the yarn ends is completed, and then a compressed fluid is jetted from the splicing nozzle to effect splicing.

4,411,129
COMPOSITE YARN

Alan Parker, Bolton, and Peter J. Dickinson, Rossendale, both of England

Division of Ser. No. 218,313, Dec. 19, 1980. This application Sep. 7, 1982, Ser. No. 415,503
Claims priority, application United Kingdom, Dec. 22, 1979, 7944318
Int. Cl.³ D02G 3/36, 3/38
U.S. Cl. 57—228 3 Claims

1. A yarn including a component of staple fibres and a component formed by a continuous strand, wherein some of the staple fibres form an inner core around which the continuous strand is twisted and some of the staple fibres form a sheath twisted around the inner core and the continuous strand.

4,411,130
HEAD FOR THE SIMULTANEOUS LAYING OF OPTICAL FIBERS WITHIN A GROOVED CYLINDRICAL SUPPORT

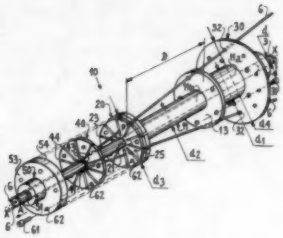
Gilles Dubois, and Jean P. Hulin, both of Conflans Sainte Honorine, France, assignors to Lignes Telegraphiques et Telephoniques, Conflans-Ste. Honorine, France

Filed Feb. 9, 1982, Ser. No. 347,255
Claims priority, application France, Feb. 17, 1981, 81 03062
Int. Cl.³ D07B 5/00; D01H 13/04
U.S. Cl. 57—352 10 Claims

1. A head for the simultaneous laying of optical fibers within grooves formed in the periphery of a cylindrical support rod, comprising:

a hollow tube through which the support rod passes longitudinally in continuous motion;

a first member having the shape of a washer and a larger diameter than the tube, said member being rigidly fixed to and located in alignment with said tube, said support rod being permitted to pass through a central opening formed in said member, said central opening being provided with an internal flange having radial projecting portions equal in number to the grooves of the support rod so that each projecting portion rests substantially at the bottom of a groove, said washer-shaped member being provided with



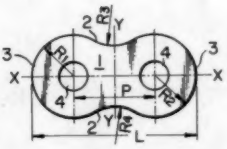
radial slits formed in its periphery and spaced at the same angular intervals as the projecting portions of said flange, each optical fiber being thus caused to engage within one slit and positioned with respect to one groove of said support rod;

a cylindrical member for inserting the optical fibers in the grooves of the support rod, said cylindrical member being rigidly fixed to the washer-shaped member and pierced by a central opening which is located in alignment with the opening of said washer-shaped member and through which said support rod is permitted to pass, each fiber being applied by said inserting member within one groove of said support rod.

4,411,131
CHAIN LINK PLATE

Tatsuo Ohnishi; Takeshi Uemura, and Teruo Nakajima, all of Osaka, Japan, assignors to Tsubakimoto Chain Co., Osaka, Japan

Filed Jan. 5, 1981, Ser. No. 222,238
Claims priority, application Japan, Mar. 25, 1980, 55-036911
Int. Cl.³ F16G 15/14
U.S. Cl. 59—78 4 Claims



1. A link plate for a link-type chain, said link plate including a pair of enlarged end parts joined together by an intermediate constricted part, each end part having an opening extending therethrough, said link plate being symmetrical about a first axis which extends longitudinally of the link plate and passes through the centers of the openings, the link plate also being symmetrical about a second axis which extends perpendicular to the first axis and perpendicular to the axes of said openings and passes through a point on said first axis which is the midpoint between the axes of said openings, the improvement wherein each end part has a convex curved exterior edge

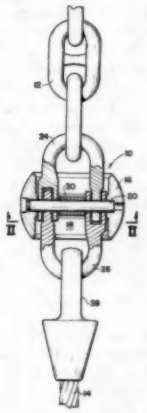
surface generated about a first radius which is centered on the first axis, wherein the intermediate constricted part has upper and lower concave curved exterior edge surfaces each defined about a second radius which is generated about a center point located in sidewardly spaced relationship from the link plate, the second radius being equal to the first radius, the concave curved exterior edge surface of the intermediate constricted part being merged with the convex curved exterior edge surface of the adjacent end part along a common line which is tangential to both curved exterior edge surfaces, wherein the longitudinal distance between the centers of said openings is equal to twice said first radius, wherein said convex exterior edge surface as associated with each end part includes opposite side edge surface portions which are of selected lengths and are intersected by a third axis which is parallel to said second axis but extends through the center point of said first radius as associated with the respective end part, and wherein said concave exterior edge surface as it extends from one end to the other end thereof defines a contour which is identical to the contour of said side edge surface portion of said convex exterior edge surface so that the concave exterior edge surface on a first said link plate in its entirety compensatingly contacts the side edge surface portion of a second said link plate when said first and second link plates are positioned in side-by-side but longitudinally offset relationship to one another.

4,411,132

WIRE ROPE TO CHAIN CONNECTOR FOR ANCHORING SYSTEMS

Edward J. Crook, Jr., Tulsa, Okla., assignor to The Crosby Group, Tulsa, Okla.

Filed Aug. 31, 1981, Ser. No. 297,837
Int. Cl.³ F16G *15/04*
U.S. Cl. 59—85 **5 Claims**



1. A connector for coupling a chain to a wire rope comprising:

a housing having an axially symmetric opening through said housing and an exterior surface circularly concentric to said opening;

a retaining pin adapted to mount within said housing such that said pin perpendicularly intersects the longitudinal axis of said opening at essentially the center of said housing;

a pair of substantially U-shaped members capable of being assembled within said opening of said housing and said U-shaped members having openings at the end of each arm of said U-shaped members such as to interact, when assembled, with each other so that the openings will be coaxial and will accept said retaining pin; and

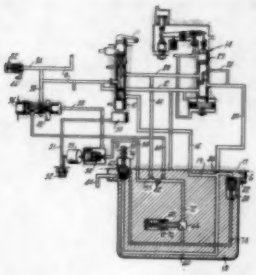
a means to maintain said U-shaped members, pin and housing in an assembled state.

4,411,133

FUEL CIRCUITS FOR FUEL CONTROLS

Charles F. Stearns, East Longmeadow, Mass., and Herbert W. Tutherly, Windsor, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 29, 1980, Ser. No. 191,544
Int. Cl.³ F02C *9/04*
U.S. Cl. 60—39.281 **7 Claims**



1. A hydromechanical fuel control for controlling fuel flow to a gas turbine engine including:

three parallel flow circuits between an inlet and an outlet to the engine;

a first circuit including a motor valve responsive to engine power requirements dividing into one branch with a first throttle valve window and another branch with a servo valve window;

a second circuit including a second throttle valve window in parallel with the servo valve window of said first circuit; and

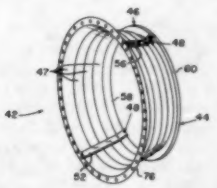
a third circuit including valve means providing fuel flow as a function of a compressor discharge pressure.

4,411,134

APPARATUS FOR THE REPAIR AND REPLACEMENT OF TRANSITION DUCTS ON JET ENGINES AND BRACKET THEREFOR

David L. Moir, 2 Barbara Rd., Lake Ronkonkoma, N.Y. 11779

Filed Oct. 26, 1981, Ser. No. 314,573
Int. Cl.³ F02C *7/20*
U.S. Cl. 60—39.31 **11 Claims**



1. Apparatus for replacing a fatigued transition duct assembly on a jet engine comprising a replacement louvered transition duct formed as a plurality of sections each of which has complementary joining ends,

a bracket,

said bracket being defined by a planar member having two faces,

a spaced array of louvered segments affixed to one face of said planar member such that respective ones of said

louvered segments are adapted to receive and interfit with respective ones of the louvers of adjacent joining ends of two of said duct sections,

a rigid offset element affixed to and extending from said one face of said planar member with the plane of said offset element disposed essentially at right angles to the disposition of said louvered segments and oriented so as to substantially divide the same,

and means on said joining ends of said duct sections for assembling the same to said offset element whereby when said joining ends of said duct sections are received in said bracket and assembled on opposite sides of said offset element, each of said louvered segments substantially fills the space of the respective louver of the joining ends and causes the other face of said planar member to be disposed along the interior periphery of the assembled duct sections effectively bridging and sealing the joint that exists therebetween.

4,411,135

DRIVE UNIT, ESPECIALLY FOR MOTOR VEHICLES

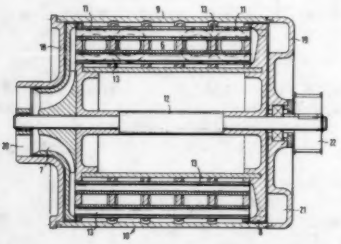
Helmut Striebich, Karlsruhe, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche AG, Stuttgart, Fed. Rep. of Germany

Filed Apr. 22, 1981, Ser. No. 256,618

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1980, 3016228

Int. Cl.³ F01K *23/10*; F02C *1/04*

U.S. Cl. 60—616 **9 Claims**



1. In a drive assembly, especially for motor vehicles, of the type comprising an internal combustion engine and an exhaust-gas turbine unit including a compressor, a secondary turbine and an exhaust-gas turbine having hollow blades and driven by the exhaust gases of the internal combustion engine, interconnected with each other, through which an operating medium flows from the compressor to the secondary turbine, means for utilizing both kinetic energy and heat energy of the exhaust gases of the internal combustion engine by a thermal work process superimposed in said exhaust-gas turbine, wherein said means for utilizing comprises hollow blade means fluidically communicating with said compressor and said secondary turbine for passing a working medium compressed by said compressor therethrough to said secondary turbine with said medium being in heat exchange relationship with the exhaust gases while in said hollow blade means and expanding in said secondary turbine and releasing power, the turbine blades being formed by pipes with a substantially circular cross section rigidly connected with said exhaust gas turbine.

4,411,136

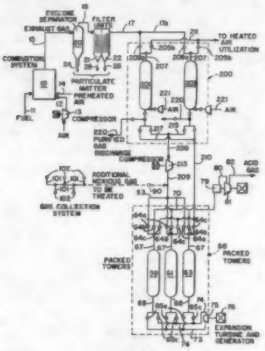
SYSTEM FOR TREATING AND RECOVERING ENERGY FROM EXHAUST GASES

Harald F. Funk, 68 Elm St., Murray Hill, N.J. 07974

Continuation-in-part of Ser. No. 962,103, Nov. 17, 1978, Pat. No. 4,265,088, which is a continuation-in-part of Ser. No. 674,219, Apr. 6, 1976, Pat. No. 4,126,000, which is a continuation-in-part of Ser. No. 565,045, Apr. 4, 1975, Pat. No. 3,970,524, which is a continuation-in-part of Ser. No. 486,562, Jul. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 252,610, May 12, 1972, abandoned. This application Nov. 10, 1980, Ser. No. 205,348

Int. Cl.³ F01K *21/00, 3/00*

U.S. Cl. 60—648 **25 Claims**



1. A process of treating hot exhaust gas containing environmentally harmful components to separate said components and recover at least a portion of the thermal energy of said gas, comprising the steps of:

(a) removing particulate matter from the gas;

(b) passing said gas through a heat exchange zone in direct heat exchange relationship with a relatively high heat capacitance solid material to transfer a portion of the thermal energy of the gas to the solid material for concurrently cooling said gas and heating said solid material;

(c) separating the harmful, less volatile components of said gas from the more volatile components;

(d) compressing the gas at some time prior to the completion of step (c);

(e) discharging the more volatile components of the cooled gas to atmosphere;

(f) processing the less volatile components of the cooled gas; and

(g) recovering at least a portion of the thermal energy of said gas by passing a first heat transfer fluid other than said gas in direct heat exchange relationship with said heated solid material to concurrently cool said solid material and heat said first fluid.

4,411,137

PRIMING DEVICE FOR BURNER MANIFOLDS OF GAS TURBINE ENGINE

Maurice N. Pearce, Mickleover, England, assignor to Rolls-Royce Limited, London, England

Filed Sep. 28, 1981, Ser. No. 306,524

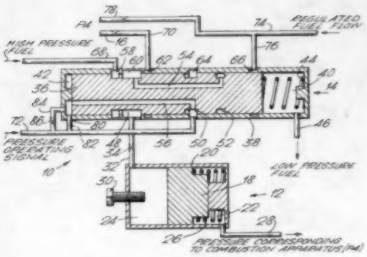
Claims priority, application United Kingdom, Oct. 30, 1980, 8034940

Int. Cl.³ F02G *1/00*

U.S. Cl. 60—739 **8 Claims**

1. A fuel priming device for gas turbine engine burner manifolds comprising a fuel accumulator, a control valve, a control valve operating means, a regulated fuel supply, a relatively high pressure fuel supply and at least one burner manifold, the

fuel accumulator and the regulated fuel supply are arranged to supply fuel sequentially to the burner manifold through the control valve, and the relatively high pressure fuel supply is arranged to supply fuel to the fuel accumulator through the control valve, the control valve being moveable by the control valve operating means from a first position in which the fuel accumulator is connected to the relatively high pressure fuel



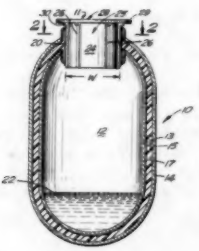
supply to a second position in which the relatively high pressure fuel supply is disconnected from the fuel accumulator and the fuel accumulator is connected to the burner manifold to provide a metered quantity of fuel to the burner manifold against a pressure in the burner manifold and a third position in which the regulated fuel supply is connected to the burner manifold and the fuel accumulator is disconnected from the burner manifold.

4,411,138

NECK TUBE CLOSURE ASSEMBLY FOR CRYOGENIC CONTAINERS

Douglas R. Leithauser, Indianapolis, and John K. Young, Carmel, both of Ind., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Aug. 17, 1982, Ser. No. 408,915
Int. Cl.³ F17C 7/02
U.S. Cl. 62—50 **15 Claims**



1. In combination a cryogenic storage container having inner and outer walls separated by a vacuum space filled with insulating material, an elongated neck tube traversing the outer and inner walls in a substantially vertical direction from the designated top end of the container to provide therethrough an access opening into the interior of the container for introducing and removing perishable products with said neck tube having a predetermined geometry and size, a predetermined measure of a cryogenic refrigerant located within the interior of said container, and a closure assembly removably inserted within said neck tube, said closure assembly comprising;

a neck plug having an elongated body with a periphery conforming in geometry to the geometry of the neck tube;

a cover plate transversely mounted upon said neck plug and having an annular rim overhanging said neck plug for supporting said neck plug in said neck tube; and

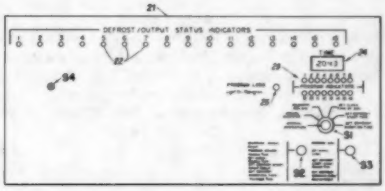
a multiplicity of spacer elements arranged about the periphery of said neck plug and radially extending therefrom to establish a concentric relationship between said neck plug and neck tube and to form an annular clearance space therebetween which is uniform in cross sectional dimension and with additional spacer elements for separating said rim of said cover plate from said container so as to extend said clearance space therebetween, said spacer elements occupying a minimum of space within said annular clearance space.

4,411,139

DEFROST CONTROL SYSTEM AND DISPLAY PANEL

Peter J. Bos, Manitowoc, Wis., assignor to AMF Incorporated, White Plains, N.Y.

Filed Apr. 9, 1981, Ser. No. 252,668
Int. Cl.³ F25B 49/00; F25D 21/06
U.S. Cl. 62—126 **8 Claims**



1. A defrost control apparatus for one or more refrigeration units having associated defrosting equipment comprising:

input means for selectively producing corresponding to each of said refrigeration units programming data, a user defrost initiate signal, a user defrost terminate signal, a program defrost initiate time review signal, and a program defrost duration review signal;

memory means for storing said programming data;

processing means responsive to stored defrost initiate time and duration data for providing a program constrained defrost control output corresponding to each of said refrigeration units, and responsive to a user initiate defrost signal corresponding to a selected refrigeration unit for providing an initiate defrost control output thereto and for a predetermined period, and responsive to a user terminate defrost signal corresponding to a selected refrigeration unit to provide a terminate defrost output thereto, and responsive to a program defrost initiate time review signal to interrogate said memory means and provide data signal representative to the stored defrost initiate time corresponding to a selective refrigeration unit, and responsive to a program defrost duration review signal to interrogate the memory means and provide data signals representative of the stored defrost duration time for a selected refrigeration unit;

display means responsive to said program constrained defrost control outputs for providing indicia indicative of the defrost status thereof, and to provide indicia indicative of a manually initiated defrost cycle in response to said user initiated output, and to provide indicia indicative of a manually terminated defrost cycle in response to said user terminate defrost output, and to provide indicia indicative of the stored defrost initiate time in response to said data signals representative of the stored defrost initiate time for a selected refrigeration unit, and to provide indicia indicative of the stored defrost duration time in response to said data signals representative of the stored defrost duration time for a selected refrigeration unit;

said input means comprising a mode selector switch, and a data advance/set switch, and a data enter switch,

said mode selector switch having a program review mode function position and said data advance/set switch being actuatable with said mode selector switch in program review mode function position to constrain said processing means to interrogate the stored defrost initiate time data and to actuate a display indicia indicative of the programmed defrost initiate relative time for a display indentified defrost control output; and

the actuation of the program review mode function is permitted while and without interruption to the normal sequencing and timing of the defrost cycle of the defrost control outputs as constrained by the stored defrost initiate and duration time data.

4,411,140

ABSORPTION TYPE COOLING AND HEATING SYSTEM

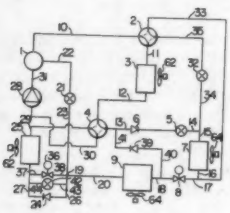
Naoto Katsumata; Noriaki Horiuchi, and Shigeru Kimura, all of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 1, 1982, Ser. No. 344,803

Claims priority, application Japan, Feb. 9, 1981, 56-17001

Int. Cl.³ F25B *13/00*

U.S. Cl. 62—324.2 **6 Claims**



1. An absorption type cooling and heating system comprising:

a path connecting a generator through a first change-over valve, an outdoor heat exchanger, a second change-over valve, a first valve, a first expansion valve, a first indoor heat exchanger, a second valve and a second indoor heat exchanger to a point of confluence with a diluted solution, so that the two indoor heat exchangers can be connected in series with each other;

a path connecting said generator to said point of confluence through a pressure reducing valve;

a path connecting said point of confluence to an absorber through a third valve;

a path connecting said absorber to said generator through said second change-over valve and a solution pump;

a path connecting said first change-over valve to a second expansion valve through said first indoor heat exchanger;

a path connecting said second expansion valve to said outdoor heat exchanger through said first change-over valve;

a path connecting said outdoor heat exchanger to said point of confluence through said second change-over valve, said absorber and a fifth valve;

a path connecting said point of confluence to said second change-over valve through said second indoor heat exchanger and an eighth valve; and

a path connecting a third expansion valve in series with said third valve.

4,411,141

PARALLEL OPERATION COMPRESSOR TYPE REFRIGERATING APPARATUS

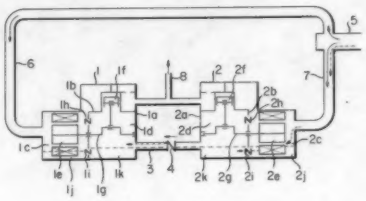
Akira Hara, Wakayama, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 30, 1981, Ser. No. 335,662

Claims priority, application Japan, Feb. 6, 1981, 56/17102

Int. Cl.³ F25B *43/02*

U.S. Cl. 62—468 **4 Claims**



1. A parallel operation compressor type refrigerating apparatus comprising:

first and second compressors, each of said compressors having a partition in the crankcase thereof separating the crankcase in a motor chamber and a compressing element chamber, said partition having a pressure equalizing opening in the upper part thereof and a lubricant equalizing non-return valve in the lower part thereon in the lubricant sink in the lower part of the crankcase and allowing passage of lubricant only from said motor chamber into said compressing element chamber;

a suction pipe means adapted to conduct lubricant-containing refrigerant gas from a refrigeration cycle system to said compressor type refrigerating apparatus and having a separation means at its downstream end for separating the circulating lubricant-containing refrigerant gas into refrigerant gas and lubricant;

a first suction branch pipe means extending from said separation means to said first compressor for supplying a portion of the refrigerant gas to said first compressor;

a second suction branch pipe means extending from said separation means to said second compressor for supplying the remainder of the refrigerant gas and the separated lubricant to said second compressor;

a pressure and lubricant equalizing pipe means connecting the lubricant sinks of said compressing element chambers of said first and second compressors; and

a non-return valve means in said pressure and lubricant equalizing pipe means for permitting flow of lubricant only from said second compressor to said first compressor.

4,411,142

ELASTIC YARN SUPPLY PACKAGE

Klaus J. Regenstein, Willich, Fed. Rep. of Germany, assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jul. 14, 1982, Ser. No. 398,224

Claims priority, application Fed. Rep. of Germany, Jul. 24, 1981, 3129350

Int. Cl.³ D04B *7/04*

U.S. Cl. 66—196 **8 Claims**

1. An improved elastic thread supply package in the form of a double-face, two thread-system, warp-knit tape from which elastic threads may be unravelled and wherein the repeating stitch pattern from each thread system is no more than two

wales wide, the improvement comprising for ease of splitting the package into narrower tapes, the stitch patterns from each

bar having underlaps which form no crossovers between adjacent wales.

4,411,143

LAUNDRY TREATMENT MACHINE

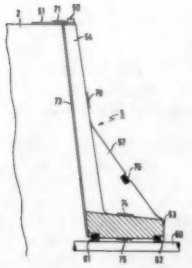
Michael Scholl, Poing, and Herbert Klassen, Fürstenfeldbruck, both of Fed. Rep. of Germany, assignors to Bosch-Siemens Hausgeräte GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 1, 1981, Ser. No. 279,527

Claims priority, application Fed. Rep. of Germany, Jul. 2, 1980, 3025088

Int. Cl.³ D06F *21/04, 33/02*

U.S. Cl. 68—12 R **7 Claims**



1. Laundry treatment machine comprising a housing, a carrier disposed in the housing, a laundry drum rotatably supported by said carrier, said carrier having parts thereof being exposed to loads affected by the weight of the drum, electromechanical transducers being disposed on said parts of said carrier and producing output signals representing a measure of the weight and the weight change of said drum, and a signal processing device receiving said output signals, said electromechanical transducers being in the form of strain gauges, and said carrier including a drum container for said drum and members connecting said drum to said drum container, at least one of said strain gauges being attached to said connecting members.

4,411,144

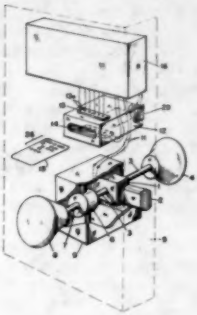
ELECTRONIC LOCK SYSTEM

Kemal Aydin, Little Falls, N.J., assignor to Kadex, Inc., New York, N.Y.

Division of Ser. No. 75,957, Sep. 17, 1979, abandoned, which is a division of Ser. No. 849,163, Nov. 7, 1977, Pat. No. 4,177,657, which is a continuation of Ser. No. 667,105, Apr. 16, 1976. This application Mar. 16, 1981, Ser. No. 244,316

Int. Cl.³ E05B *49/02*

U.S. Cl. 70—278 **4 Claims**



1. In an electronic lock system wherein a lock has a memory for storing a changeable code, means for receiving and reading a coded key, means for comparing the code read from the key with the code stored in the memory, and means responsive to said comparison for opening the lock; the improvement wherein said key has first and second coded regions, and said lock comprises means for comparing the code of said first field with the code of said memory, means responsive to a given code in said second field for changing the code in said memory, said means for opening said lock being responsive only to a comparison of the code in the memory and said given code in said second field for opening said lock, whereby a given key can be employed only once in the opening of said lock.

4,411,145

CAN-MAKING METHOD

Leon L. Lewis, Butler Township, Butler County, and Michael V. Murray, Monroeville Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 155,272, Jun. 2, 1980. This application Jan. 18, 1982, Ser. No. 340,561

Int. Cl.³ B21D *22/28, 51/26*

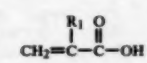
U.S. Cl. 72—42 **11 Claims**

1. Method of forming a workpiece of blackplate comprising placing on one surface thereof a coating of a composition comprising, in an aqueous carrier,

(A) about 5% to about 20% organic moiety comprising:

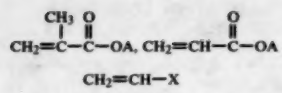
(i) in an amount from about 3 parts to about 9 parts by weight of an acrylic polymer comprising:

(a) from about 5% to about 35% by weight of a polymerizable, ethylenically unsaturated monomer having the structural formula



wherein R_1 is selected from the group consisting of hydrogen and a methyl radical and

(b) from about 65% to about 95% by weight of at least one ligand-free, polymerizable, ethylenically unsaturated monomer selected from the group consisting of monomers having the structural formulas:



and mixtures thereof wherein A is an organo radical having from about one to about ten carbon atoms, and X is an organo radical selected from the group consisting of aryl and alkaryl radicals, and

(ii) about 1 part to about 20 parts by weight of a wax, and

(B) about 15% to about 45% finely divided molybdenum disulfide, and

(C) in a concentration sufficient to provide a mole ratio of metal ions to total carboxylic acid group equivalents (M^{++}/COO^{-}) from about 0.075 to about 0.500 of a cross-linking agent represented by the formula $M(NH_3)_nY_2$ wherein M is a metal selected from the group consisting of Zn, Cd, Cu, Ni, and mixtures thereof, n is the coordination number of said metal and is an integer from four to six, Y is an equivalent of a carboxyl-containing anion selected from the group consisting essentially of carbonate, formate, and acetate,

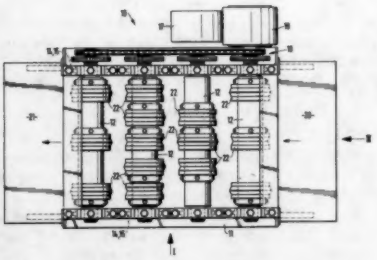
and forming said workpiece.

4,411,146

METHOD AND APPARATUS FOR THE STRAIGHTENING AND STIFFENING OF STARTING SHEETS IN ELECTROLYTIC REFINING PLANTS

Jukka Sulasaari, Tampere, and Seppo Heinonen, Rauma, both of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Apr. 15, 1981, Ser. No. 254,412
Claims priority, application Finland, Apr. 15, 1980, 801203
Int. Cl.³ B21D *1/10*
U.S. Cl. 72—180 **11 Claims**



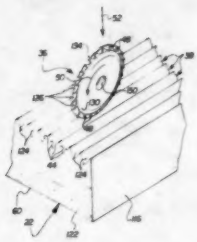
1. A method for the straightening and stiffening of starting sheets in electrolytic refining plants, comprising shaping the same predetermined areas of the starting sheet surfaces at least once during successive shaping stages in such a manner that the elasticity range of the starting sheet material is at least in part exceeded, comprising pressing certain areas of the sheet in one shaping stage into patterns deviating from the plane of the starting sheet surface, then pressing the same areas in the opposite direction in a second shaping stage to work harden the sheet material, the pressing force of a movable roller of each of a plurality of roller pairs against the other roller of each roller pair being adjusted in order to produce a pressing force of desired degree.

4,411,147

ROLLING DIES AND METHOD OF FORMING THE SAME

Terry D. Capuano, Hinckley, Ohio, assignor to Russell Burdsall & Ward Corporation, Mentor, Ohio

Filed Aug. 12, 1981, Ser. No. 292,256
Int. Cl.³ B21H *3/06*
U.S. Cl. 72—220 **19 Claims**



1. A method comprising the steps of providing a thread rolling die having a plurality of longitudinally extending thread form ridges with each of the thread form ridges having a crest portion and a pair of flank surfaces extending between the crest portion and root portions disposed on opposite sides of the thread form ridge, providing a circular hob having an annular forming section with projections thereon and a first smooth annular side surface area disposed radially inwardly of the forming section, and forming indentations in one of the flank surfaces of one of the thread form ridges at locations spaced from the crest portion of the one thread form ridge by rolling the circular hob along the one flank surface of the one thread form ridge while leaving the crest portion of the one thread form ridge free of indentations, said step of forming indentations in the one thread form ridge by rolling the circular hob along the one thread form ridge including pressing the projections on the annular forming section of the hob into a portion of the one flank surface adjacent to a root portion of the one thread form ridge and sliding the first smooth annular side surface area of the hob on a portion of the one flank surface adjacent to the crest portion of the one thread form ridge.

4,411,148

PRESS BRAKE

Hans Aschauer, Eferding, and Günter Funk, Traun, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Mar. 25, 1981, Ser. No. 247,226
Claims priority, application Austria, Apr. 24, 1980, 2203/80
Int. Cl.³ B21D *5/04*
U.S. Cl. 72—306 **8 Claims**

1. In a press brake comprising a frame, a driven bending tool, a second tool adapted to cooperate with the driven bending tool for bending a sheet metal element, clamping means for holding the sheet metal element in fixed position relative to the tools, and a four-bar linkage for driving the driven bending tool, the improvement of the four-bar linkage comprising

(a) two crank arms mounted on the frame, the crank arms each having respective first ends,

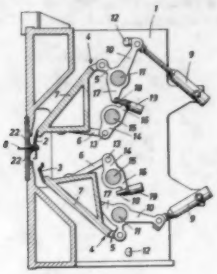
(b) an adjustable pivot mounting one of the crank arms at an end opposite to the first end thereof on the frame,

(c) a link connecting the first ends of the crank arms, the link carrying the driven bending tool,

(d) an adjusting drive for adjusting the adjustable pivot of the one crank arm relative to the frame, the drive comprising a double-armed adjusting lever pivotally mounted on the frame, one arm of the adjusting lever carrying the adjustable pivot with said adjustable pivot linking the one adjusting lever arm to the opposite end of the one crank arm, and a

control lever operatively connected to an end opposite to the first end of the other crank arm, the control lever cooperating with the other arm of the adjusting lever, and

(e) means for driving the link carrying the driven bending tool



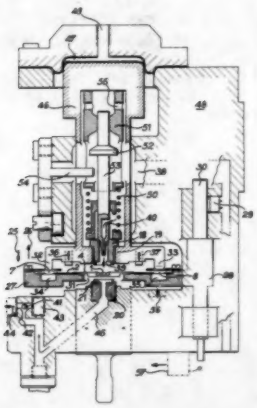
by imparting a predetermined angular movement to the other crank arm and actuating the adjusting drive in response to said angular movement by the control lever which is operatively connected to the other crank arm and cooperates with the other adjusting lever arm.

4,411,149

MACHINE FOR BENDING CONDUCTORS OF A SEMICONDUCTOR CHIP DEVICE

Raymond L. Delorme, Bagnolet, France, assignor to Compagnie Internationale pour l'Informatique Cii Honeywell Bull, Paris, France

Filed Dec. 2, 1981, Ser. No. 326,591
Claims priority, application France, Dec. 5, 1980, 80 25856
Int. Cl.³ B21D *5/01*
U.S. Cl. 72—385 **17 Claims**



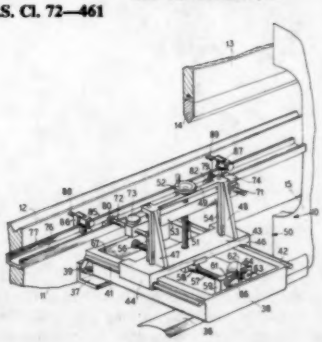
1. In a machine for bending the extending conductors of an integrated circuit chip (1) to form contacts (12) for mounting of the chip to a connection substrate (10), said chip being preliminarily mounted on an insulating support (2) provided with at least one opening (3) at the center of which the chip is located, conductors (4) extending across the opening and connecting points of contact (17) of the chip (1) with the conductors (4) on the insulating support (2) while supporting the chip (1) in the opening (3), each said conductor having a connector section represented by a part of the conductor (4) which extends from the corresponding contact point (17) of the chip (1) to the neighborhood of a force relieving structure (9) connected with conductor (4) and located adjacent the edge of the opening (3), said machine comprising a bending base (20), movable bending means disposed opposite the base (20), means (27) for displacing the insulating support for the chips and for bringing each chip onto the base (20) in a first direction (25) perpendicular to the chip (1), and to remove the chip after bending, in the said perpendicular direction, but in a second direction (26) opposed to the first direction, and means (39, 40) for positioning the chip on the base, the improvement comprising the bending base (20) having a recessed housing (21) the circumference of which is slightly greater than the circumference of the chip (1) for receiving the chip and a plane rim (23) adapted to engage the contacts (12) to be bent adjacent the circumference of the chip, and the movable means for bending including a first movable poiece (18) movable within a second piece (19) in the said perpendicular direction and in the first and second directions, said first movable piece (18) being situated opposite the base (20) and having a plane rim (24) corresponding to the plane rim (23) of the base, and adapted to be positioned so as to wedge the contacts (12) of the chip (1) adjacent the circumference of the chip during bending of the conductors, and the second piece (19) being movable in said perpendicular direction and in the two directions, said second movable piece (19) surrounding the first piece (18) and adapted to bend the conductors (4) to form the contacts (12) for each of which to have a bend (13) which takes the form of the outline of the rim (23) of the base (20) and a linear part (14) connected to said bend (13) in a direction substantially perpendicular to the chip, forming said linear part for connecting in continuous manner with the remaining portion (15) of the conductor (4) situated between said linear part and the insulating support (2), and elastic means (50) interposed between the first and second pieces to apply to the first piece (18) a force opposing the relative movement of the first piece (18) with respect to the second piece (19).

4,411,150

BACKGAUGE STRUCTURE

Dean A. Klein; Steven C. Davis, both of Lake City, and Jerome J. Wroblewski, Red Wing, all of Minn., assignors to Houdaille Industries, Inc., Fort Lauderdale, Fla.

Filed Oct. 21, 1981, Ser. No. 313,293
Int. Cl.³ B21D *11/22*
U.S. Cl. 72—461 **4 Claims**



1. A metal working machine including a frame member with a first die, a movable ram supported on said frame, a second die carried by said ram to engage and form metal in cooperation with said first die, driving means for said ram, a movable backgauge assembly engageable with said metal to index the assembly attached to said frame, a pair of parallel horizontal guide shafts for said backgauge attached to said frame, a carriage with a pair of ways in which said guide shafts are received, a lead screw rotatable attached to said frame and threadedly received by said carriage, carriage drive means

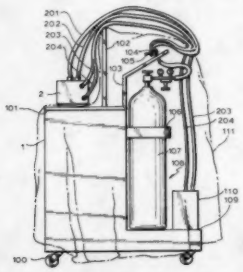
connected to said lead screw to drive said carriage away from and toward said first and second dies, a pair of upright members attached to said carriage, a horizontal member attached to said pair of upright members, a pair of parallel horizontally extending support bars attached to opposite ends of said horizontal member, a gauging channel member attached to the ends of said pair of horizontally extending support bars which are nearest to said first and second dies, a pair of spaced gauging finger supports attached to the edge of said gauging channel member nearest said first and second dies, said gauging finger supports each including a body member with a top groove formed therein which extends to the front surface nearest said first and second dies, a rectangular shaped finger holder formed with a hemispherical rear surface mounted in said top groove, a pair of L-shaped slots formed in said body member, a pair of L-shaped arms attached to said finger holder and extending through said L-shaped slots, spring means attached to said L-shaped arms to bias said finger holder to a horizontal position in said groove, and a gauging finger mounted in said finger holder, including a threaded adjustment shaft threadedly received in said body member with one end engageable with said hemispherical surface of said finger holder and adjustable to vary the position of body member toward and away from said first and second dies, wherein said finger holders can be rotated upwardly out of said groove against the bias of said spring means such that said hemispherical surface of said finger holder slides on the end of said threaded adjustment shaft, and wherein said gauging finger is a round shaft with an extending flatted surface.

4,411,151

DEVICE FOR CALIBRATING GAS ELECTRODES

Manfred Kessler, an den Harindicsm 50, 8520 Erlangen, Fed. Rep. of Germany, and Jens Höper, Erlanngen, Fed. Rep. of Germany, assignors to Manfred Kessler, Erlangen, Fed. Rep. of Germany

Filed Apr. 29, 1981, Ser. No. 258,725
Int. Cl.³ G01N *33/48*
U.S. Cl. 73—1 G **3 Claims**



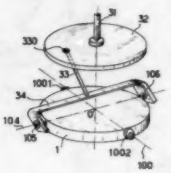
1. Device for calibrating gas electrodes within sterile environment of an operation room, comprising a movable frame having one side to be sterilized and another side which remains nonsterile; a work table arranged on said frame at said one side; a calibrating chassis mounted on said table at said one side and carrying a gas calibrating container into which an electrode to be calibrated is inserted; a gas supply unit mounted on said frame at another side thereof; a yoke mounted on said work table and separating said one side from said another side; hoses connected to said gas calibrating container and provided with rapid clutches connectable to said gas supply unit, said another side and said yoke being covered with sterile cloth, said yoke supporting said hoses such that they extend from said one side over said yoke to said another side.

4,411,152

METHOD AND APPARATUS FOR TESTING PIPES

Werner Röll, Hamm, Fed. Rep. of Germany, assignor to Estel Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Jul. 28, 1981, Ser. No. 287,630
Claims priority, application Fed. Rep. of Germany, Aug. 1, 1980, 3029180
Int. Cl.³ G01M *3/28*
U.S. Cl. 73—46 **18 Claims**



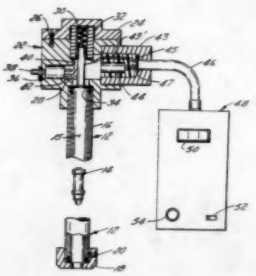
1. A method for testing tightness of threaded connections of oilfield pipes, comprising the steps of: threading a tapped connecting sleeve onto a threaded pipe end portion to establish a threaded connection therebetween; subjecting the region of the threaded pipe end portion connected to said sleeve to internal hydraulic pressure; and applying pressure additionally from the outside to the sleeve end; and limiting the volume of hydraulic pressure medium by an annular ring-shaped space along said threaded connection, pressure applied from the outside compensating said internal hydraulic pressure for preventing widening of the sleeve and accompanying leakage between pipe and sleeve threads.

4,411,153

SCLEROMETER

Alfred H. Lewis, 1455 Sherbrooke W., Montreal, Quebec, Canada

Filed Apr. 27, 1982, Ser. No. 372,144
Int. Cl.³ G01N *3/48*
U.S. Cl. 73—79 **7 Claims**

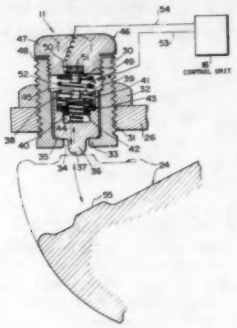


1. A hardness tester comprising a guiding member having an elongated passageway therein, a striker freely movable in said elongated passageway, means for retaining said striker in a position remote from one end of said passageway, means for releasing said striker from said retaining means to permit said striker to freely move to said one end, timer means, said timer means having first means associated therewith to activate the timer when a first sound wave impinges thereon, second means to stop said timer when a further sound wave impinges thereon.

4,411,154
SWITCH FOR SENSING A PRESET POSITION OF A THROTTLE VALVE

Hidetoshi Kitamura, Higashikurume, and Hirohisa Kato, Tokyo, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Jan. 18, 1982, Ser. No. 340,494
Claims priority, application Japan, Feb. 20, 1981, 56-23880[U]
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—118 10 Claims



1. A switch for sensing a preset position of a throttle valve in an internal combustion engine, comprising:

(a) a lever secured to said throttle valve for movement through a predetermined path corresponding to movement of said throttle valve;

(b) a stationary casing disposed in said path such that said lever encounters said casing when said lever moves toward the casing, whereby the throttle lever is stopped by encountering the casing;

(c) a plunger movably disposed in said casing;

(d) first means for resiliently holding said plunger normally in a position in which part of the plunger projects from the casing in said path whereby when the lever moves toward the casing and the plunger, the lever encounters the plunger first and the casing second and moves the plunger until the lever encounters the casing and is stopped by said casing;

(e) a first contact supported on the casing;

(f) a second contact and second means for movably supporting said second contact on the plunger in opposed relation to said first contact for movement with said plunger toward said first contact, such that when said lever moves toward the casing and the plunger, the second contact engages the first contact before the lever encounters the casing; and wherein

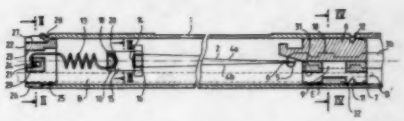
(g) said second means includes means for resiliently holding the second contact normally in a position fixed with respect to the plunger in which the second contact is separated from the first contact when said plunger is held in its normal position and permitting said plunger to move slightly relative to said second contact after said first and second contacts have engaged.

4,411,155
SENSOR FOR DETECTING THE LEVEL OF LIQUID IN A TANK

Jean Coulange, Conflans Sainte-Honorine, France, assignor to e.d. Veglia, Paris, France

Filed Jun. 29, 1981, Ser. No. 278,566
Claims priority, application France, Jun. 27, 1980, 80 14377
Int. Cl.³ G01F *23/24*
U.S. Cl. 73—295 5 Claims

1. A sensor for detecting the level of a liquid which comprises a conducting wire whose resistance has a high coefficient of temperature, the wire forming at least one pair of substantially parallel strands; adjacent connection pieces to which the ends of said wire are fixed; a tubular housing open at its upper and lower opposite ends; a spring having one end thereof connected to said wire at the junction of said strands; a removable assembly spindle; a lower holding piece fixedly mounted at the lower end of said tubular housing and provided

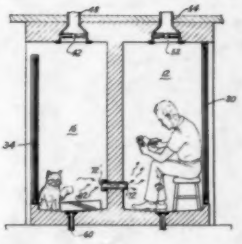


with an axial passage for said removable assembly spindle, the other end of said spring being hooked to said lower holding piece; and an upper holding piece for holding said connection pieces, said upper holding piece being slidable in said tubular housing and fixedly mounted near the upper end of said tubular housing and being provided with an axial passage with abutment for said removable assembly spindle.

4,411,156
ODOR TESTING APPARATUS

Henry E. Lowe, 21725 Allegheny St., Cassopolis, Mich. 49031

Filed Feb. 5, 1981, Ser. No. 231,867
Int. Cl.³ G01N *1/22, 33/24, 33/48*
U.S. Cl. 73—432 R 15 Claims



1. A structure for testing small animal litter, comprising a plurality of animal confinement compartments in which the animals live and consummate their daily functions and in which litter for animal waste is placed for use by the animals, a compartment for enclosing a person testing the odors of the litter in particular animal compartments, port means near the bottom of each animal compartment, separate air flow conduits connecting said port means with the odor tester compartment for drawing air from the lower portion of the animal compartment into the tester compartment, a valve means for controlling each of said conduits, a fan for creating a flow of air from said animal compartments through selected port means and conduits and into said tester compartment, and an access door through which a tester can enter the tester compartment without passing through an animal compartment.

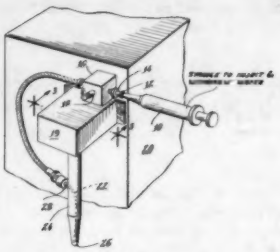
4,411,157
CONTAMINATION-FREE TRANSFER AND PURGE APPARATUS

Eugene R. Babin, 10 Buttonball Ter., Norwalk, Conn. 06851, and William R. Drago, 22 Gerry St., Greenwich, Conn. 06830

Filed May 27, 1982, Ser. No. 382,809
Int. Cl.³ G01N *1/28*
U.S. Cl. 73—864.81 7 Claims

4. A method for transferring a fluid sample from a container to a purge and trap sampler without exposing said fluid sample to the atmosphere comprising the steps of withdrawing the fluid sample from the container by means of a hypodermic

syringe, connecting the syringe to a valve body on said sampler without exposing said fluid sample to the atmosphere moving a two-way valve to its open position, providing a purge vessel having a tubular-shaped side arm on said sampler,



providing a tubing connected at one end to said valve body and passing the free end thereof through said side arm whereby the extremity of said tubing is positioned in the bottom of said purge vessel so that a contamination-free fluid sample is introduced into said sampler for processing.

4,411,158

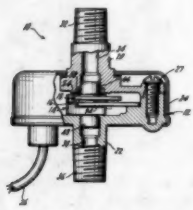
APPARATUS FOR SENSING THE CONDITION OF A FLUID

Alfred Schaff, Jr., Marina Del Rey, Calif., assignor to Ametek, Inc., New York, N.Y.

Filed Apr. 14, 1981, Ser. No. 254,114

Int. Cl.³ G01L *9/06*

U.S. Cl. 73—721 **7 Claims**



1. An apparatus for sensing the condition of a pressurized fluid, comprising:

a semiconductor chip having a diaphragm portion adapted for exposure to a pressurized fluid and an adjacent terminal portion adapted for connection to external circuitry for providing a measurement of the condition of the pressurized fluid, said semiconductor chip having sensing elements integrally formed within said diaphragm portion beneath a protective semiconductor layer, and conductor elements in electrical contact with said sensing elements, said conductor elements being integrally formed within said chip beneath said protective semiconductor layer and extending from said diaphragm portion to said terminal portion;

a housing having wall; and

means for mounting said semiconductor chip with said housing with the walls of said housing spaced from said semiconductor chip, said mounting means cooperating with said housing to form a fluid barrier for confining the flow of said pressurized fluid into contact with said diaphragm portion and isolating said diaphragm portion from said terminal portion to prevent said terminal portion from being exposed to said pressurized fluid while permitting the pressurized fluid to contact said diaphragm portion so that the condition of the pressurized fluid can be sensed.

4,411,159

A FIBRE REINFORCED RESIN COMPOSITE LEAF SPRING FOR DETERMINING THE MAGNITUDE OF A LOAD

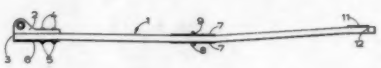
Peter Spear, Wolverhampton, and Paul A. Anson, Walsall, both of England, assignors to Rubery Owen Group Services Limited, Wednesbury, England

Filed Jul. 10, 1981, Ser. No. 282,079

Claims priority, application United Kingdom, Jul. 12, 1980, 8022876

Int. Cl.³ G01L *1/22*

U.S. Cl. 73—768 **11 Claims**



1. A method of making a fibre-reinforced, resin composite leaf spring for determining the magnitude of a load, comprising the steps of: superimposing a first outer spring element, an inner element and a second outer spring element and bonding said elements together, said inner element comprising a plurality of layers of cured resin impregnated fibres and each said outer element comprising at least one layer of spring material; during laying up of said layers introducing into a part of the composite leaf spring in which a bending moment is induced in use a strain responsive member which is orientated so as to be subjected to a strain resulting from the bending moment induced in use and which by being introduced during the laying up of said layers is thereby located, embedded and secured within the solid finished composite leaf spring, and embedding within the composite leaf spring signalling means extending between said strain responsive member and an end of the composite leaf spring.

5. A fibre-reinforced, resin composite leaf spring for determining the magnitude of a load made by the method according to claim 1 and in which said signalling means (said first signalling means) is adapted to communicate a signal (said first signal) from said strain responsive member (said first strain responsive member) to an indicator or monitoring device, a second strain responsive member is located and held within the composite leaf spring in proximity to said first strain responsive member, and second signalling means is provided embedded within the composite leaf spring and adapted to communicate to the indicator or monitoring device a signal (said second signal) from said second strain responsive member, such that the resultant or summation of said first and second signals taken together is a function of either a strain detected by said first strain responsive member when said second strain responsive member is at a neutral plane of the composite leaf spring when loaded and said first strain responsive member is spaced from said neutral plane, or of strains detected by said first and second strain responsive members when both said strain responsive members are spaced from said neutral plane.

4,411,160

VANE MODULUS SOIL TESTER

Alan J. Lutenegger, Ames, and John M. Pitt, Nevada, both of Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jul. 27, 1981, Ser. No. 287,414

Int. Cl.³ G01N *3/24*

U.S. Cl. 73—843 **20 Claims**

1. A vane modulus soil tester, comprising,

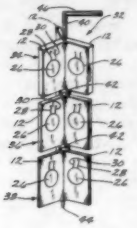
a plurality of generally thin blades having opposite surfaces,

means for supporting said blades in generally radially extended and circumferentially spaced-apart relation,

at least two pressure sensors each being operative to measure

pressure changes on a single surface of a blade, one pressure sensor being mounted on one blade and facing in one rotational direction and the other being mounted on another blade and facing in the opposite rotational direction, and

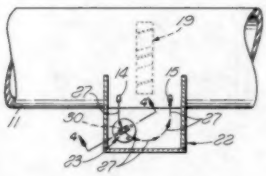
power means for rotating said blades in opposite directions.



4,411,161
MASS FLOWMETER OR THE LIKE

Milton H. November, Hacienda Heights, Calif., assignor to International Telephone & Telegraph Corporation, New York, N.Y.

Filed Aug. 10, 1981, Ser. No. 291,569
Int. Cl.³ G01F 1/90, 15/04
U.S. Cl. 73—861.03 8 Claims



1. A mass flowmeter comprising: a hollow cylindrical pipeline section having an external surface; first means fixed relative to said section to provide an enclosed space adjacent said surface; a quartz tuning fork fixed inside said space; a detector fixed relative to said tuning fork, said section having first and second passageways extending therethrough, said first passageway being provided to admit a portion of a gas flowing inside said section into said enclosed space, said entering gas moving into engagement with said tuning fork to cause the same to vibrate at a frequency which is a function of the density of said entering gas, gas in said space flowing out of said space through said second passageway and thus returning to the interior of said section; a turbine meter having a rotor rotatably mounted inside said section between said first and second passageways, said turbine meter producing output pulses at a pulse repetition frequency f_0 directly proportional to the rate of volume flow of said gas inside said section; and second means connected from said detector and from said turbine meter to produce an electrical output of a magnitude proportional to a function m, where

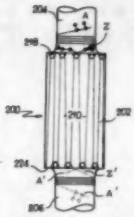
$$m = Kf_0(AT^2 + BT + C),$$

and where A, B, C and K are constants, and T is a period directly proportional to the vibrational period of said tuning fork, said function being proportional to the mass flow rate of said gas inside said section, B being smaller or larger than zero or equal to zero, the sole power to said quartz tuning fork being from the flow of said gas.

4,411,162
GAUGE WIRE DYNAMOMETER WOUND AND CONNECTED IN AN ELECTRICAL BRIDGE ARRANGEMENT

Jean-Claude Valadier, Paris, France, assignor to Testut Aequitas, Paris, France

Filed Feb. 19, 1981, Ser. No. 235,913
Claims priority, application France, Mar. 7, 1980, 80 05153; Jun. 20, 1980, 80 13727
Int. Cl.³ G01L 1/22
U.S. Cl. 73—862.65 18 Claims

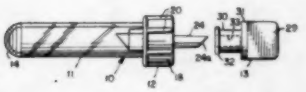


1. A dynamometer of the type comprising a testing body having a substantially continuous solid surface, said body being deformable under the effect of an applied force, sensing means comprising gauge wire and adapted to detect said deformation of the testing body, the gauge wire being connected in an electrical bridge arrangement, said body defining bearing zones formed integrally as a part of the material of the testing body, which zones are adapted to receive and retain in position four series of windings of prestressed gauge wire, remaining in close contact with the testing body, a first two of which having principal segments oriented parallel to the force to be applied, and the other two of which having principal segments oriented perpendicularly to the force to be applied, said four series of windings forming the electrical bridge arrangement, the segments oriented parallel to the force to be applied being located in opposite arms of the bridge arrangement, as are the segments oriented perpendicularly to the force to be applied, said bearing zones receiving the first two series of windings having their principal segments oriented parallel to the force to be applied being constituted by circular shoulder machined in the material of the testing body to produce a circular edge used for anchoring the gauge wire.

4,411,163
VENTABLE SAMPLE COLLECTION DEVICE

Fred K. White, Miami, Fla., assignor to American Hospital Supply Corporation, Evanston, Ill.

Filed Jul. 27, 1981, Ser. No. 287,277
Int. Cl.³ A61B 5/14
U.S. Cl. 73—864.02 17 Claims



1. A device for collecting fluid samples for laboratory use, comprising an open-ended vial having at least one arcuate flange projecting outwardly therefrom at said open end; a cap having a generally cylindrical side wall and an end wall defining a cavity removably received on the open end of said vial; said cap having an elongated collection tube portion projecting outwardly from said end wall and an inner tube portion disposed within said cavity and aligned with said collection tube portion; said cap also having at least one internal thread pro-

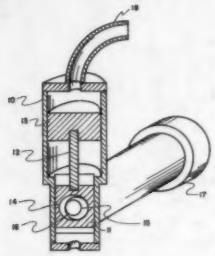
vided by the inner surface of said side wall and engagable by said flange for directing said vial axially when said flanged end of the vial is rotated within said cavity; said end wall having a vent opening therethrough; said vent opening being positioned and arranged to be sealed by said flange when said open end of said vial is fully threaded into said cavity of said cap.

4,411,164

ROTARY TO RECIPRICATING MOTION TRANSLATOR

Peter Durenec, Annandale, and Aubrey J. Dunn, Springfield, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 2, 1981, Ser. No. 269,205
Int. Cl.³ F16H *25/08*; F01B *9/00*
U.S. Cl. 74—55 **6 Claims**



1. A device for converting rotary motion to reciprocating motion including:

a shaft capable of rotating about a central longitudinal first axis;

a circular cam on said shaft with its center offset by a predetermined distance from said first axis;

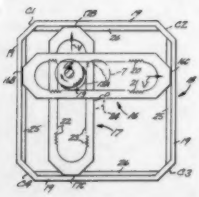
a yoke assembly including a yoke with an elliptical slot therein, whereby said cam fits into said slot, and a yoke guide which supports said yoke for reciprocating motion along a second axis normal to said first axis and whereby, as said shaft is rotated at a constant angular velocity about said first axis, said yoke reciprocates with a sine wave motion along said second axis.

4,411,165

POWER TRANSMISSION UNIT WITH INFINITE SPEEDS

Lyle B. Evans, 9135 SW. Summerfield Ct., Tigard, Oreg. 97223

Continuation-in-part of Ser. No. 235,417, Feb. 17, 1981, abandoned. This application Nov. 19, 1981, Ser. No. 322,950
Int. Cl.³ F16H *21/42*
U.S. Cl. 74—63 **18 Claims**



1. A power transmission unit comprising,

a housing,

a power input shaft,

a speed selector assembly adjustably carried by the housing and including gear means, said gear means including a pinion gear powered by said input shaft,

a rotor,

a power output shaft driven by said rotor,

gear rack components within said housing and in driving engagement with said rotor,

said pinion gear adapted to impart motion to the gear rack components,

a cam structure movable with the speed selector assembly and acting on said gear rack components, and

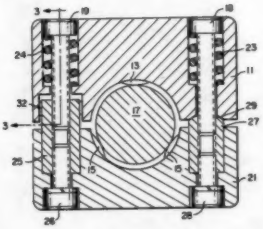
said speed selector assembly positionable so as to locate said pinion gear proximate the axis of rotor rotation, said speed selector additionally positionable to locate the pinion gear away from the axis of rotor rotation whereat the pinion gear sequentially drives the gear rack components along vectors offset from the axis of rotor rotation whereby a speed reduction is effected between the power input and output shafts.

4,411,166

PRECISE LINEAR ACTUATOR

Mitch Marcovici, Murray Hill, N.J., assignor to Keuffel & Esser Company, Morristown, N.J.

Filed Mar. 16, 1981, Ser. No. 244,444
Int. Cl.³ F16H *25/08, 25/18*
U.S. Cl. 74—89 **5 Claims**



1. In a mechanism for converting rotation of a drive shaft into linear displacement along the axis of said shaft; which mechanism comprises a pair of body members joined to substantially encompass the circumference of said shaft, and a plurality of roller members mounted on said body members and distributed regularly about said shaft circumference in rolling surface contact therewith, the axes of said roller members being disposed at an angle to said shaft axis to thereby cause said roller members to follow helical paths along the shaft surface during contacting rotation therewith resulting in displacement of said mechanism along said shaft axis; the improvement in means for joining said body members which eliminates indiscriminate displacement of said mechanism with respect to said shaft, said improvement comprising:

(a) means situated on one side of said shaft forming a ball joint between said body members;

(b) means urging said body members into contact at said ball joint;

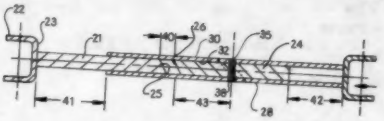
(c) first means situated on the opposite side of said shaft for urging said body members about the horizontal, shaft-parallel axis of said ball joint toward contact at said opposite side, thereby urging said roller members into contact with said shaft; and

(d) second means situated on said opposite side of said shaft for urging said body members about the vertical axis of said ball joint toward contact at said opposite side.

4,411,167
BREAKAWAY SHAFT ASSEMBLY

John D. Mohr, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 13, 1981, Ser. No. 310,566
Int. Cl.³ B62D 1/18
U.S. Cl. 74—492 10 Claims



1. A breakaway shaft assembly, comprising:

(a) a segmented shaft member;

(b) a segmented tube member, at least one of said segmented shaft and tube members having mating camming surfaces at the location of segmentation;

(c) means for retaining said segmented tube member and one segment of said segmented shaft member together for conjoint axial movement due to axial loading until both segments of said shaft member are interengaged, whereupon said retaining means is overcome allowing both said tube member segments to telescopically move relative to said shaft member segments in response to further axial loading;

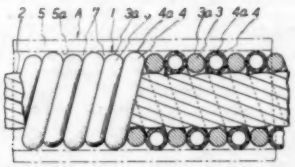
and

(d) means for limiting the telescopic travel of said tube member relative to said shaft member when said location of segmentation for each of said tube member and shaft member are aligned, whereupon breakaway separation of the segments of each of said members occurs in response to still further axial loading.

4,411,168
INNER CABLE

Junnosuke Yoshifuji, Takarazuka, Japan, assignor to Nippon Cable System, Inc., Hyogo, Japan

Filed Feb. 18, 1981, Ser. No. 235,570
Int. Cl.³ F16C 1/10
U.S. Cl. 74—501 R 3 Claims



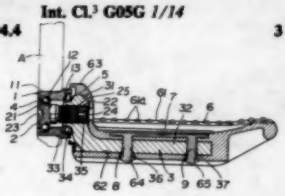
1. In an inner cable comprising a core and teeth formed by spirally winding at least one metal wire on the outer surface of the core at the same intervals, the improvement which comprises:

a hollow plastic member which is made of synthetic resin, is deformable in accordance with depression pressure of opposed tooth members, is restorable to an original form after removal of said pressure, and is spirally wound on the outer surface of the core so as to be positioned between the adjacent teeth, a top portion of said elastic member projecting outwardly higher than those of said adjacent teeth, whereby when said inner cable and an inner surface of a conduit into which said inner cable is inserted slideably in contact together, noise is reduced and when said adjacent teeth mesh with said opposed tooth members, said hollow elastic member between said adjacent teeth is deformed by said opposed tooth members to an extent so as not to prevent the meshing.

4,411,169
PEDAL FOR A BICYCLE

Nobumi Takeda, Sakai, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Oct. 18, 1979, Ser. No. 85,950
Claims priority, application Japan, Nov. 11, 1978, 53-155523[U]
Int. Cl.³ G05G 1/14
U.S. Cl. 74—594.4 3 Claims



1. A pedal for a bicycle, comprising:

a bearing cylinder having means for connecting said bearing cylinder to a bicycle crank arm;

a pedal shaft supported rotatably to said bearing cylinder, said pedal shaft supporting an L-shaped frame having a vertical portion connected to said pedal shaft and a rod-like horizontal portion of non-circular cross section displaced with respect to the axis of said pedal shaft and extending in the same direction as the axis of said pedal shaft, said frame having at said vertical portion a projecting portion extending in the same direction as the axis of said pedal shaft, said projecting portion having at a central portion thereof a threaded bore screwably connected with said pedal shaft and at the outer periphery thereof a ball race, said pedal shaft having a ball race at the outer periphery thereof, said ball races carrying balls which rotatably support said pedal shaft and frame to said bearing cylinder;

a pedal body comprising a main body portion and a pedal outline portion formed in continuation of said main body portion, said pedal body having on the upper surface thereof near an outer peripheral portion a foot bearing surface, said main body portion having at a substantially intermediate portion thereof a longitudinal fitting bore extending in the same direction as the axis of said pedal shaft and opening at a side facing said crank arm, said fitting bore having a non-circular cross section complementary to that of said frame and being large enough to receive therein and cover said frame so that said frame is fit into said fitting bore and covered by said pedal body to support said pedal body to said frame and to lock said pedal body from relative rotative movement with respect to said frame; and

fixing means for fixing said pedal body to said frame.

4,411,170
WIRE ROLLING MILL IN BLOCK FORM, A SO-CALLED WIRE BLOCK WITH AT LEAST ONE DRIVEN LINE SHAFT

Herbert Vogelgesang, St.-Ingbert, Fed. Rep. of Germany, assignor to Mannesmann Aktiengesellschaft, Dusseldorf, Fed. Rep. of Germany

Filed Apr. 10, 1981, Ser. No. 252,933
Int. Cl.³ F16H 37/06
U.S. Cl. 74—661 6 Claims

1. A wire rolling mill comprising:

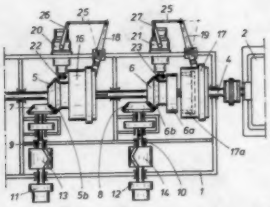
a driven line shaft;

a plurality of driving bevel gears freely rotatably mounted on said driven line shaft;

a plurality of clutch means associated respectively with said driving bevel gears for selectively coupling said associated driving bevel gears to said driven line shaft;

a plurality of driven bevel gears meshed respectively with associated ones of said driving bevel gears;

a plurality of driven stand shafts connected to associated ones of said driven bevel gears, whereby actuation of one of said clutch means causes an associated driving bevel gear, driven bevel gear and driven stand shaft to rotate at a first speed;



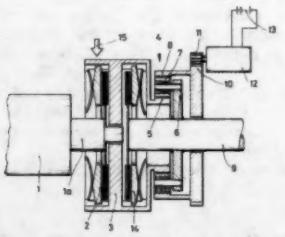
a plurality of supplementary drive means associated with respective ones of said driven stand shafts for rotating the associated driven stand shaft at a second speed, lower than said first speed, when actuated; and

a plurality of safety means associated with respective ones of said clutch means and associated supplementary drive means for disengaging a clutch means when the associated supplementary drive means is actuated and disengaging a supplementary drive means when the associated clutch means is actuated.

4,411,171
VEHICLE DRIVE

Ernest Fiala, Wolfsburg, Fed. Rep. of Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Fed. Rep. of Germany

Filed Jun. 10, 1981, Ser. No. 272,217
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022373
Int. Cl.³ F16H *37/06*; B60K *41/08, 9/04, 41/28*
U.S. Cl. 74—675 **9 Claims**

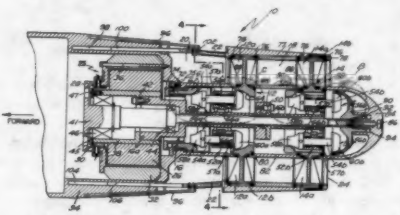


1. In a vehicle having an internal combustion engine, a flywheel associated with said engine, a drive shaft, a first clutch means arranged between said flywheel and said drive shaft for coupling said flywheel to said drive shaft, and a second clutch means arranged between said flywheel and said engine for coupling said engine to said flywheel, the improvement comprising a motor-generator means, a planetary gear train connected between said flywheel and said motor-generator means, wherein said gear train includes a planetary gear carrier for mounting a planetary gear, and means for rigidly connecting said planetary gear carrier with said drive shaft.

4,411,172
VARIABLE SPEED REDUCING AND TORQUE TRANSMITTING SYSTEM

Michael DeMarco, Middletown, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 20, 1981, Ser. No. 236,478
Int. Cl.³ F16H *37/06*
U.S. Cl. 74—690 **3 Claims**



1. A variable speed transmission comprising:

driving means adapted to be rotated around a common axis at a rotational velocity, said driving means for driving at said rotational velocity;

a first plurality of satellites with each of said first plurality of satellites arranged in contact with said driving means, each of said first plurality of satellites adapted to be rotated on its own axis by said driving means and to be rotated around said common axis by said driving means at said driving means rotational velocity;

a second plurality of satellites with each of said second plurality of satellites arranged in contact with said driving means, each of said second plurality of satellites adapted to be rotated on its own axis by said driving means and to be rotated around said common axis by said driving means at said driving means rotational velocity;

a first impeller abutting each of said first plurality of satellites in such a manner as to be driven by said first plurality of satellites;

a first speed control means abutting each of said first plurality of satellites; said first speed control means controlling the speed of said first impeller, said first speed control means including a first piston having said common axis, said first piston adapted to be displaced in a direction along said common axis;

each of said first plurality of satellites include a shaft with a concave radius piece at one end and a convex radius piece at the other end, one of said radiused pieces abutting said first piston and the other of said radiused pieces abutting said first impeller;

a second impeller abutting each of said second plurality of satellites in such a manner as to be driven by said second plurality of satellites;

a second speed control means abutting each of said second plurality of satellites; said second speed control means controlling the speed of said second impeller, said second speed control means including a second piston having said common axis, said second piston adapted to be displaced along said common axis;

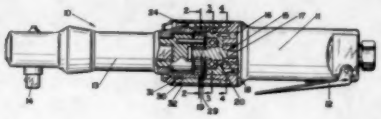
each of said second plurality of satellites include a shaft with a concave radius piece at one end and a convex radius piece at the other end, one of said radiused pieces abutting said second piston and the other of said radiused pieces abutting said second impeller; and

said first and second impellers are arranged to have said common axis and are displaced from each other along said common axis.

4,411,173
MULTI-PURPOSE FRONT END PLATE FOR MOTOR OF PNEUMATIC TOOL

John E. Mixer, Chardon, Ohio, assignor to Black & Decker Inc., Newark, Del.

Filed Sep. 1, 1981, Ser. No. 298,378
Int. Cl.³ F16H *57/10*
U.S. Cl. 74—785 6 Claims

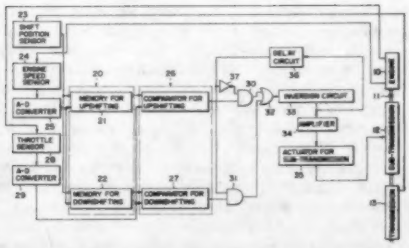


1. In combination with a pneumatic tool or other device having a motor housing and further having a second housing forwardly of the motor housing, a motor in the motor housing, the motor having a liner and further having a rotor provided with a rotor shaft, a multipurpose front end plate for the motor, said end plate comprising a cylindrical member having a bore and a counterbore therein, the counterbore providing a bearing seat, a bearing in the bearing seat, the rotor shaft passing through the bore and being journaled in the bearing, a pinion gear on the end of the rotor shaft forwardly of the bearing, the cylindrical member further having an integral annular portion extending forwardly of the bearing, an internal ring gear formed within the annular extending portion, gearing means between the internal ring gear and the pinion gear on the rotor shaft, the annular extending portion of the cylindrical member further having an outer cylindrical surface for piloting the second housing thereon, and means for circumferentially alining the cylindrical member with the motor housing, said means including a hole formed in the motor housing, the cylindrical member having an external pocket formed thereon, and a ball seated between the hole and the pocket.

4,411,174
TRANSMISSION SHIFT CONTROL DEVICE

Takeshi Yokoi, and Noritaka Yanagihara, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Continuation of Ser. No. 46,171, Jun. 7, 1978, abandoned. This application Apr. 27, 1981, Ser. No. 258,031
Claims priority, application Japan, Aug. 30, 1978, 53-105826
Int. Cl.³ B60K *41/04*
U.S. Cl. 74—866 12 Claims



1. A transmission shift control device for control of transmission of a vehicle having an internal combustion engine with an intake system, said control comprising:

throttle sensor means for generating an actual throttle signal representing the present throttle opening of the engine intake system;

engine speed sensor means for generating an actual engine speed signal representing the present engine rotational speed;

shift position sensor means for generating an actual shift position signal designating the present shift position of said transmission;

upshifting memory means, which stores upshifting limits for various values of one of said throttle signal and said engine speed signal corresponding to various shift positions of said transmission, for providing one of said stored upshifting limits as an upshift limit signal in accordance with (1) the other of said throttle signal and said engine speed signal and (2) said shift position signal;

downshifting memory means, which stores downshifting limits for various values of said one of said throttle signal and said engine speed signal corresponding to various shift positions of said transmission, for providing one of said stored downshifting values as a downshift limit signal in accordance with (1) said other of said throttle signal and said engine speed signal and (2) said shift position signal;

first comparator means, which receives said upshift limit signal from said upshifting memory means and said one of said throttle signal and said engine speed signal for comparing these two received signals with each other, and for generating an upshift demand signal when said one of said throttle signal and said engine speed signal is smaller than said upshift limit signal;

second comparator means, which receives said downshift limit signal from said downshifting memory means and said one of said throttle signal and said engine speed signal, for comparing these two received signals with each other and for generating a downshift demand signal when said one of said throttle signal and said engine speed signal is larger than said downshift limit signal; and

switching circuit means, which receives said upshift demand signal from said first comparator and said downshift demand signal from said second comparator, for determining shifting of said transmission in accordance with receipt of one of said upshift demand and downshift demand signals.

4,411,175
METHOD FOR MAKING A RING-SHAPED MOLD

Kenichi Takahashi; Koichi Hirano, both of Kodaira, and Shoji Futamura, Kawasaki, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo and Institute of Technology Precision Electrical Discharge Works, Kawasaki, both of, Japan

Filed Oct. 6, 1980, Ser. No. 193,977
Claims priority, application Japan, Oct. 18, 1979, 54/134512
Int. Cl.³ B21K *5/20*; B23P *17/00*
U.S. Cl. 76—107 R 19 Claims

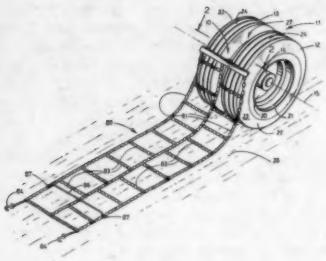
1. A method of constructing a ring-shaped mold for tire manufacturing and which includes radially outer portions having an inside diameter defining a tire track configuration comprising:

forming a workpiece ring having the inside diameter with the tire track configuration;

cutting the workpiece ring along a plurality of angularly spaced radial lines to form it into a plurality of blocks

using a wire cutting tool which cuts a minimum of the material away from the workpiece;
and thereafter assembling the blocks into an annular shape to form a ring-shaped mold;
the workpiece ring including opposite faying surfaces;
said method including cutting the workpiece ring from opposite outside faces thereof only into the faying surfaces using a saw which cuts to an increased width with repsect to the wire cutting tool.

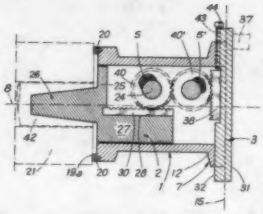
4,411,176
ASSEMBLY FOR INSTALLING CHAINS
Lonnie L. Mason, 2725 Canary Dr., Visalia, Calif. 93277
Filed Jan. 5, 1981, Ser. No. 222,497
Int. Cl.³ B60C *27/06*
U.S. Cl. 81—15.8 **5 Claims**



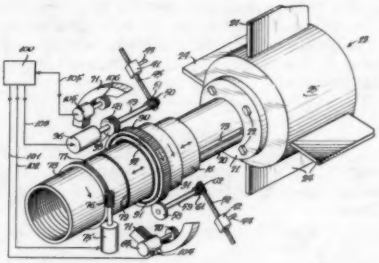
1. An assembly for installing chains or the like on dual wheels rotational about an axis of rotation and having circumferentially extending treads and juxtaposed substantially curved sidewalls, the assembly comprising a frame having a first portion dimensioned for engagement with the treads of both wheels when disposed in a primary attitude in contact with the treads substantially parallel to the axis of rotation of the wheels, a second portion deployed for extension between the sidewalls of the wheels and a third portion borne by the second portion in spaced relation to the first portion and dimensioned for engagement with the sidewalls of the wheels when the first portion is disposed in said primary attitude to bind the frame on the wheels with said wheels captured between the first and third portions of the frame, said third portion of the frame having convex surfaces which face and engage the sidewalls of the dual wheels when the first portion of the frame is disposed in said primary attitude and the third portion of the frame being adjustable to move said convex surfaces toward or from each other; and means borne by the frame for supporting chains in depending relation thereon.

4,411,177
NUMERICAL CONTROL SURFACING PLATE
Michel Batistoni, Dracy le For[illegible]rance, assignor to Framatome, Courbevoie, France
Filed Mar. 11, 1981, Ser. No. 242,763
Claims priority, application France, Mar. 14, 1980, 80 05835
Int. Cl.³ B23B *3/12*
U.S. Cl. 82—2 E **4 Claims**

1. Surfacing plate for a boring and milling machine comprising a boring spindle rotatable and slidable longitudinally in a milling spindle, said plate comprising a hollow cylindrical body having a rear end fixed to the milling spindle and a front head on which a radial guide is formed for a tool holder slide the radial movement of which is controlled by the boring spindle through a mechanical control unit located inside said cylindrical body and comprising two longitudinal racks arranged on a central part sliding longitudinally inside said body under the action of said boring spindle and two radial racks fast to said tool holder slide and connected kinematically and independently to said two longitudinal racks, respectively, through two independent transmission trains, said two radial racks being arranged on two independent parts slidably mounted on said slide in the radial direction and each independently connected to said slide by an adjusting system for the opposite adjustment of the relative radial position of said two radial racks, so as to take up the slack in the kinematic transmission in each direction of the axial movement of said boring spindle.



4,411,178
PIPE END PREPARATION MACHINE
Edward H. Wachs, Lake Forest, and Horst Kwech, Lake Bluff, both of Ill., assignors to Power Cutting Incorporated, Lake Bluff, Ill.
Filed Jun. 4, 1981, Ser. No. 270,409
Int. Cl.³ B23B *3/24*
U.S. Cl. 82—4 C **5 Claims**



1. A pipe end preparation machine comprising: a frame mounted on a mast positionable in oriented relation from and beyond an end of a pipe; a tool head, means mounting the tool head on said frame for rotation about an axis, means for rotating the tool head; a tool slide, means mounting the tool slide on said tool head for movement along a path radial to said axis to provide radial feed for a tool carried thereon; and drive mechanism for moving said tool slide radially including a rotatable gear carried by the tool head, a ring gear mounted rotatably relative to said tool head and meshing with said rotatable gear, and means including a variable speed motor with an output shaft which is braked when the motor is deenergized and a disengageable clutch operable to connect or disconnect the motor output shaft with a drive gear meshing with the ring gear operable to establish three different conditions of operation of the tool slide responsive to three different conditions of operation of the ring gear including a first condition wherein the clutch is disengaged and the ring gear is free to rotate with the tool head as caused by engagement of the rotatable gear with the ring gear and the tool slide does not move radially, a second condition wherein the clutch is engaged and the motor output shaft is braked to lock the ring gear against rotation and the rotatable gear is caused to rotate by rotation of the tool head relative to the ring gear and the tool slide moves radially,

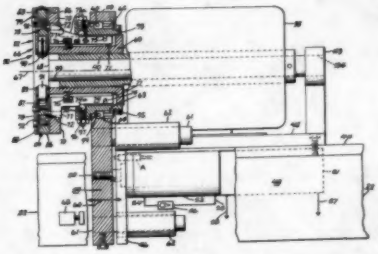
and a third condition wherein the clutch is engaged and the motor operating to rotate the ring gear and modify the rotation of the rotatable gear from that obtained in the second condition to obtain a different speed of radial movement of the tool head than that in the second condition.

4,411,179

APPARATUS FOR CUTTING TUBING INTO PREDETERMINED LENGTHS

Steven L. Stroup, 317 S. Bennett, Bluffton, Ind. 46714

Filed Sep. 26, 1980, Ser. No. 191,319
Int. Cl.³ B23B 5/14; B26F 3/00
U.S. Cl. 82—71 **4 Claims**



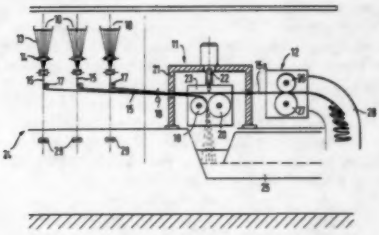
1. Apparatus for cutting metallic tubing in predetermined lengths comprising a stationary supporting frame, means on said frame for moving a straight length of tubing unidirectionally intermittently along a straight path in alignment with the longitudinal axis of said tubing, means for cutting off said tubing while it is stationary between movements; said cutting off means being in the form of a mechanism having a passage therethrough in coaxial alignment with said straight path, said mechanism including a body rotatable about the axis of said passage, a cutting device carried by said body and selectively movable radially toward and away from said passage, motor means for rotating said body, actuating means for moving said cutting device on said body; said actuating means including a member carried by said frame for reciprocation operatively connected to said cutting device whereby movement of said reciprocable member in one direction moves said cutting device radially inwardly of said passage and movement of said member in the opposite direction moves said cutting device radially outwardly, said body including a gib device having three radial guide ways equally angularly spaced apart, said cutting device being received by one of said guide ways, two cutting back-up devices received by the other two guide ways, respectively, said cutting and back-up devices being movable toward and away from said passage, said reciprocating member also being operatively connected to said back-up devices for moving them in unison with said cutting device, said motor means including an electric motor having a hollow shaft coaxially disposed relative to said straight path, said body being secured to said shaft and having a hub portion provided with a cylindrical outer surface, said hub having three elongated axially extending recesses equally angularly spaced apart in axial alignment with said three guide ways, respectively; said actuating means further including three lever elements movably disposed within said three recesses, respectively, said lever elements being pivotally connected to said hub for radial movement, one end of each lever element being connected to a respective one of said cutting and back-up devices, a sleeve slidably mounted axially on said hub but for rotation therewith, said reciprocable member being connected to said sleeve, said lever elements having inclined cam surfaces annularly aligned and disposed in cooperative relation with the interior of said sleeve, the cam surface of the lever element which is connected to said cutting device being longer than the cam surfaces on the other two lever elements, said sleeve being operatively engageable with said cam surfaces to force said cutting and back-up devices inwardly in accordance with the lengths of the respective cam surfaces.

4,411,180

PROCESS AND DEVICE FOR INTRODUCTION OF A CONTINUOUS YARN IN A CUTTING MACHINE

Giordano Roncato, Aix les Bains, France, assignor to Vetrotex Saint-Gobain, France

Filed Sep. 8, 1981, Ser. No. 299,930
Claims priority, application France, Sep. 12, 1980, 80 19704
Int. Cl.³ D01G 1/04
U.S. Cl. 83—37 **20 Claims**



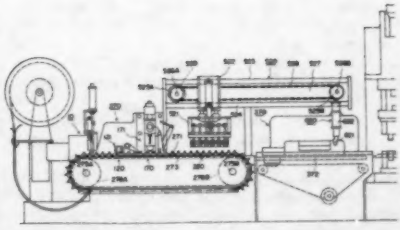
1. A process of cutting at least one continuous yarn in a cutting machine formed by a blade-carrying roll and a support roll rotating in opposite directions about axes in substantially a horizontal plane comprising drawing said yarn from an upstream location downstream to said cutting machine along a first path of movement through a zone defined by opposite sides of said blade-carrying roll, deflecting said yarn from said first path to a second path of movement along which said yarn is supported in surface contact, adjacent a cutting zone between said rolls, as it lays flat on the roll of said cutting machine disposed upstream of the other roll, moving said yarn into said cutting zone, and collecting individual substantially equal length sections cut from said yarn.

4,411,181

FULLY AUTOMATIC APPARATUS FOR PRODUCING AN ELECTRICAL CORD OF A PREDETERMINED LENGTH WITH A PLUG ATTACHED THERETO

Hideo Imai, Kyoto, Japan, assignor to Kawasaki Electric Wire Co., Ltd., Kanagawa, Japan

Filed Jun. 16, 1981, Ser. No. 274,222
Claims priority, application Japan, Mar. 22, 1979, 54-33915
Int. Cl.³ B26D 7/06; H01R 43/04
U.S. Cl. 83—150 **10 Claims**



1. An apparatus for cutting and holding a piece or wire cord, said apparatus comprising:

(a) conveyor means including a plurality of plate means for movement in a first direction, and a plurality of holding

blocks wherein each of said holding blocks is mounted on a corresponding one of said plate means, each of said holding blocks having a fixed portion and a slidable holder portion, said slidable holder portion being slidable relative to said fixed portion;

(b) advancing means for advancing said wire cord a predetermined length in a second direction perpendicular to said first direction;

(c) cutter means positioned downstream of said advancing means for cutting said wire cord into cut portions of said predetermined length; and

(d) loading means positioned downstream of said cutter means and operatively coupled thereto for engaging a holder portion of one of said holding blocks to prevent the movement of said holder portion in said first direction while said fixed portion is moved in said first direction to thereby cause a relative sliding movement between said holder portion and said fixed portion thus forming a space between two adjacent holding blocks having a width at least as great as the width of said wire cord, pushing said cut wire cord into said space, and releasing said holder portion such that said holder portion slides in said first direction whereby said cut wire cord is held between said holder portion of said one of said holding blocks and the fixed portion of an adjacent holding block.

4,411,182

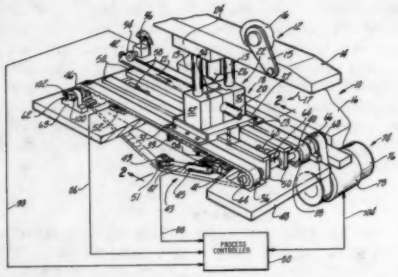
BELT DRIVEN FLYING CUTOFF APPARATUS

John J. Borzym, 4820 Schoolbell, Birmingham, Mich. 48010

Filed Apr. 27, 1981, Ser. No. 258,230

Int. Cl.³ B23D *21/00, 25/04*

U.S. Cl. 83—319 **11 Claims**



1. Apparatus for use in cutting an elongate workpiece on the fly which is continuously moving along its longitudinal axis, comprising:

a base;

a carriage assembly mounted on said base for bidirectional movement along said longitudinal axis between a starting position and a finishing position;

means mounted on said carriage assembly for cutting said workpiece; and,

means for moving said carriage assembly on said base in synchronism with the movement of said workpiece, including

(1) at least two flexible belt members fixedly secured to said carriage assembly and longitudinally extending essentially parallel to said longitudinal axis,

(2) means for mounting said belt members for bidirectional movement essentially parallel to said longitudinal axis,

(3) reversible drive means coupled with said mounting means for moving said belt members, whereby to move said carriage assembly from said starting position to said finishing position and from said finishing position back to said starting position, and

(4) means for adjusting the natural frequency of at least one of said belt members relative to the other of said belt members in order to prevent resonance of said belt members.

4,411,183

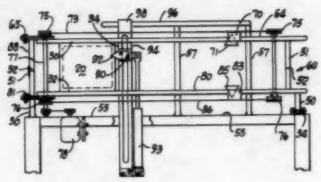
APPARATUS FOR CUTTING PIE-SHAPED OPENINGS IN FIBERBOARD DUCT

Mark J. Auer, 23520 Lake Rd., Bay Village, Ohio 44140

Division of Ser. No. 169,916, Jul. 17, 1980. This application Sep. 28, 1982, Ser. No. 425,498

Int. Cl.³ B23D *23/02*

U.S. Cl. 83—581 **5 Claims**



1. Apparatus for cutting pie-shaped cuttings in a linear unit of fiberboard hollow duct having an upper wall, a lower wall, an inner sidewall, and an outer sidewall wherein each pie-shaped cutting comprises corresponding triangular cuts in the duct upper and lower walls and intervening vertical cuts in the duct interior sidewall corresponding to the base of the triangular cuts, the apparatus comprising:

a pair of movable upper knives movably supported on a lower guide means and adapted to cut a triangular cut in the upper duct wall with the apex angle adjacent to the outer sidewall and the base adjacent to the inner sidewall, said guide means adjustable to provide an apex angle cut between about 5 and 85 degrees;

a pair of movable lower knives movably supported on a lower guide means and adapted to cut a triangular cut in the lower duct wall corresponding and vertically below to the triangular cut in the upper duct wall;

and a pair of vertically movable knives movably supported on support means adapted to align with the base points of the corresponding upper and lower triangular cuts to produce pie-shaped cuts capable of being removed from the duct;

and said knives operated by drive means to cause reciprocating cutting movement of said knives.

4,411,184

MUSICAL INSTRUMENT HAVING PROGRAMMABLE AUTOMATIC RHYTHM PATTERN VARIATIONS

David A. Jones, deceased, late of Villa Park, Ill. by Diane S. Jones, administrator, assignor to Marmon Company, Chicago, Ill.

Continuation of Ser. No. 163,084, Jun. 26, 1980, abandoned. This application Apr. 23, 1982, Ser. No. 371,383

Int. Cl.³ G09B *15/02;* **G10H** *1/40*

U.S. Cl. 84—1.03 **7 Claims**

1. In an electrical musical instrument having an automatic rhythm system which varies rhythm patterns in response to rhythm variation signals, rhythm variation select signals, variation clock signals to control the rate of change of said rhythm variations and an automatic variation signal, an operator programmable rhythm variation system comprising:

storage means for storing sequences of rhythm variation signals in response to said rhythm variation select signals;

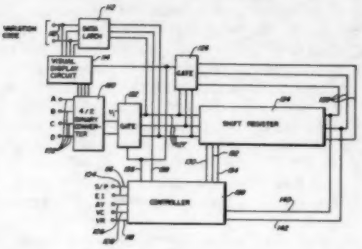
input/output means comprising:

a binary coded output converter for receiving said rhythm variation select signals and generating said rhythm variation signals;

gating means having an input connected to said converter and an output connected to said storage means for

gating said rhythm variation signals to said storage means; and

a data latch connected to the output of said gating means for storing the instant rhythm variation signal being played or programmed; and



control means responsive to said variation clock signals, said rhythm variation select signals and said automatic variation signal to control said input/output means and said storage means to store and retreive rhythm variation signals in said storage means.

4,411,185

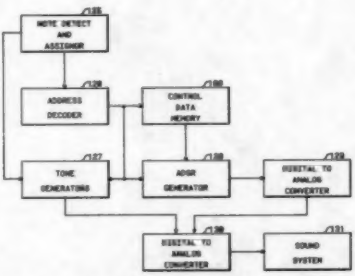
TOUCH RESPONSIVE KEYBOARD ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Kawai Musical Instrument Mfg. Co., Ltd, Hamamatsu, Japan

Filed Apr. 2, 1982, Ser. No. 364,955

Int. Cl.³ G10H *1/34, 1/46*

U.S. Cl. 84—1.27 **10 Claims**



1. In an electronic musical instrument having a keyboard comprising an array of keyboard switches, each operable in an unactuated or an actuated keyswitch state, apparatus for producing musical tones having musical tone effects responsive to the motions imparted to actuate said keyswitches comprising:

a plurality of motion transducers each of which is associated with a corresponding one of said keyboard switches whereby a transducer signal is generated by each motion transducer in response to the motion imparted to actuate its corresponding keyboard switch,

a detection means whereby a detection signal is generated corresponding to each said keyboard switch operated in its actuated keyswitch state,

a plurality of tone generators for creating musical tones each of which produces a musical tone effect in response to a tone control signal,

a maximum signal detection means whereby one said tone control signal is generated corresponding to the maximum value of each said transducer signal, and

an assignor means responsive to each said detection signal for assigning tone generators in said plurality of tone generators to actuated keyswitches and for assigning a corresponding tone control signal to each said assigned tone generator thereby producing said musical tones having musical tone effects responsive to the motions imparted to actuate said keyswitches.

4,411,186

STRINGED MUSICAL INSTRUMENT HAVING SOUNDBOARD

Eric Faivre, 12 Impasse Mousset, 75012 Paris, France

Filed Nov. 23, 1981, Ser. No. 324,260

Claims priority, application France, Dec. 2, 1980, 80 25526

Int. Cl.³ G10D *3/02*

U.S. Cl. 84—291 **17 Claims**

1. A stringed musical instrument of the type comprising a substantially rigid body and a plurality of strings attached at one end to a tailpiece, the improvement comprising a flexible soundboard of acoustic material, one edge of said soundboard bearing against said instrument body and an opposite edge of said soundboard bearing against said tailpiece, said soundboard freely extending between said one edge and said opposite edge, means for fulcruming said tailpiece on said instrument body.

4,411,187

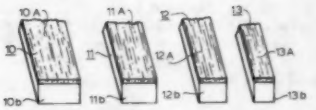
COMPOSITE MARIMBA BARS

Daleth F. Roper, 418 W. Evergreen Ave., Monrovia, Calif. 91016, and Lowell H. Montz, 1470 27th Ave., Sacramento, Calif. 95822

Filed Nov. 27, 1981, Ser. No. 325,205

Int. Cl.³ G10D *13/08*

U.S. Cl. 84—402 **10 Claims**



1. An array of vibratile musical bars having different fundamental tones and substantially similar ringing decay characteristics, each bar being a composite of a plurality of dissimilar materials and one of said materials having a longer decay characteristic wherein the bar having a higher decay period has a larger content of said one material.

4,411,188

DEVICE FOR SPEED CONTROL OF CYLINDER PISTON, PARTICULARLY USEFUL FOR A FIREARM

Olle Gustavsson, Karlskoga, Sweden, assignor to Aktiebolaget Bofors, Bofors, Sweden

Filed Dec. 18, 1980, Ser. No. 217,598

Claims priority, application Sweden, Dec. 18, 1979, 7910400

Int. Cl.³ F41F *11/07*

U.S. Cl. 89—20 A **5 Claims**

5. In a firearm having a closing mechanism operable between an open and closed position, said closing mechanism operating in response to the relative motion produced by a piston cylinder assembly, a device for controlling said relative motion comprising:

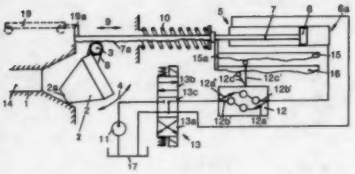
first and second constant flow valves connected to provide first and second hydraulic fluid flow paths for said piston

cylinder assembly, said flow valves each having a pin longitudinally displaceable against a spring whereby displacement of said pin controls fluid flow;

cam means providing first and second cam profiles for actuating first and second of said pins, said cam means connected to move in response to relative movement between said piston and cylinder;

first and second arms each rotatably supported at one end, the underside of said arms contacting one of said pins;

first and second link parts rotatably connected to a remaining end of said first and second arms, said link parts being spring biased in a first angular position, against a respective arm, and displaceable to a second angular position with respect to said arm;



a roller connected on an end of each link part and in contact with a respective cam profile;

a spring biasing said arms whereby respectively connected rollers are urged against one of said cam profiles whereby said cam profiles in a first direction of movement forces said link part against said first angular position displacing a respective arm and contacting pin, and in an opposite direction forces said roller and link member to be angularly displaced with respect to an attached arm inhibiting displacement of said pin.

4,411,189

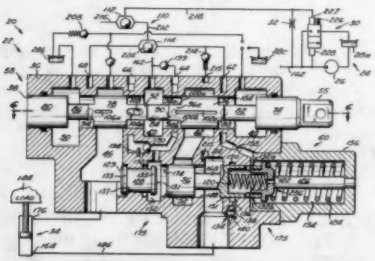
FLUID FLOW CONTROLLING DEVICE

Wendell E. Miller, Warsaw, Ind., assignor to The Scott and Fetzer Company, Lakewood, Ohio

Continuation of Ser. No. 816,865, Jul. 18, 1977, abandoned. This application Jan. 19, 1981, Ser. No. 226,394

Int. Cl.³ F15B *11/08, 13/042*

U.S. Cl. 91—420 **94 Claims**



1. In a fluid flow controlling device (**22** of FIG. **1**, **203** of FIG. **7**, or **400** of FIG. **8**) of the type having a body (**36**, **308**, or **398**) that includes a pressure inlet channel (**40** or **314**), that includes a first work port channel (**44** or **320**), and that includes return port means (**48**+**50**, **324**+**326**, or **326**+**456**+**468**) with a first branch channel (**48**, **324**, or **456**), and having selective communication means in said body for selectively communicating said pressure inlet channel with said first work port channel, and for selectively communicating said first work port channel with said first branch channel, the improvement in which said selective communication means comprises:

serivce channel means (**42** or **318**), in said body being interposed intermediate of said pressure inlet channel and said first branch channel, for receiving fluid from said pressure inlet channel and for returning fluid to said first branch channel;

selectively positionable valving element means (**54**, **312**, or **404**), communicating with said pressure inlet channel, with said work port channel, and with said service channel means, and being movable from a stand-by position (FIG. **1** or FIG. **7**) wherein said first work port channel is isolated from said pressure inlet channel, to a first operating position (FIG. **2**, or FIG. **8**) for establishing and selectively sizing a first fluid flow path (**170** of FIG. **2**, or **508** of FIG. **8**) from said pressure inlet channel to said service channel means, and to a second operating position (FIG. **3**, or FIG. **9**) for establishing and selectively sizing a second fluid flow path (**182** of FIG. **3**, or **514** of FIG. **9**) from said service channel means to said first branch channel; and

flow controlling means (**60** or **306**), interconnecting said service channel means and said first work port channel, and comprising a flow control plunger (**56**) that is movable from a free-flow position (FIG. **4**), for controlling the rate of fluid flow through said first fluid flow path in proportion to said selective sizing thereof, and for controlling the rate of fluid flow through said second fluid flow path in proportion to said selective sizing thereof.

4,411,190

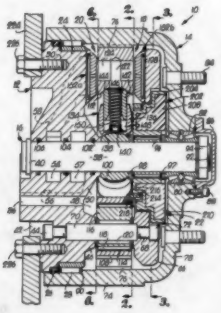
ENERGY TRANSLATION DEVICE HAVING INDIVIDUALLY COMPENSATED SLIDING VALVES AND COUNTERBALANCING MECHANISM

John B. Kilmer, 9030 Maple, Wichita, Kans. 67209

Filed May 7, 1981, Ser. No. 261,043

Int. Cl.³ F01B *1/06;* **F16K** *25/02*

U.S. Cl. 91—487 **18 Claims**



1. In an energy translation device of the type including a member shiftable along a defined path of travel and presenting a pair of opposed faces, a plurality of fluid displacement assemblies operatively associated with said member, and means for input and output of hydraulic fluid to and from said assemblies including hydraulic fluid valving apparatus for said displacement assemblies, the improvement comprising:

a pair of opposed, cooperating, apertured valve bodies located adjacent each of said displacement assemblies and respectively disposed proximal to said opposed member faces and in communication with the adjacent displacement assembly;

means mounting each of said bodies for movement thereof toward and away from said member and independently of any such movement of any other body;

structure interconnecting the opposed bodies of each respective pair of bodies in pressure-communicating relationship; and

actuation means associated with each of said bodies and operably connected to the adjacent interconnecting structure for

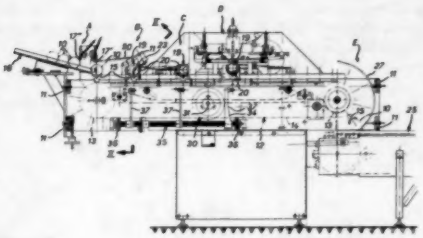
urging each pair of said opposed bodies toward said member with equal but oppositely directed forces.

4,411,191

CENTRALLY MECHANICALLY CONTROLLED PRINTING MACHINE

Guy Combeau, Aixe-sur-Vienne, France, assignor to Societe d'Exploitation des Machines Dubuit, Paris, France

Filed Jul. 22, 1981, Ser. No. 285,762
Claims priority, application France, Jul. 29, 1980, 80 16651
Int. Cl.³ B41F 17/22
U.S. Cl. 101—38 A **12 Claims**



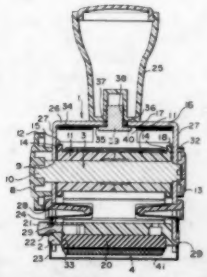
1. A centrally mechanically controlled printing machine, comprising a conveyor equipped with spaced-apart article carriers for accommodating articles to be printed, a plurality of work stations disposed along said conveyor, each of said work stations being equipped with a separate mandrel transfer unit for selectively picking up an article from one of said article carriers and dropping said article off, the operation of said mandrel transfer units being synchronously controlled by cam means responsive to the advancement of said conveyor, said cam means being at least a single cam which is provided for at least two of said work stations, a cam follower cooperable with said single cam, a central control shaft common to said two work stations, said cam follower being fixed for rotation with said central control shaft, and an actuating lever for controlling each of said mandrel transfer units being fixed for rotation with said central control shaft.

4,411,192

ROTARY STAMP

Naoyuki Fujihara, Konan, Japan, assignor to Shachihata Industrial Co., Ltd., Aichi, Japan

Filed Jan. 27, 1981, Ser. No. 228,745
Claims priority, application Japan, Feb. 1, 1980, 55-12254[U]
Int. Cl.³ B41J 1/60
U.S. Cl. 101—111 **1 Claim**



1. In a rotary stamp comprising:

an inverted U-shaped frame comprising a top plate and right and left side plates, each of said side plates having a circular opening formed substantially at the center thereof, a rectangular opening below said circular opening and a recess at the lower end thereof;

a shaft rotatably inserted into said circular openings;

a pair of spring means, each being inserted into a different one of said rectangular openings;

a bridge mounted between said recesses and having a further recess at the lower portion thereof;

cylinder means securely fitted on the outer circumference of said shaft at the portion positioned inside said side plates, said cylinder means having flanges at both ends thereof and being equipped on an outer circumference of portions between said flanges with a number of spaced apart ridges extending the full axial length of said cylinder between said flanges;

operating means for rotating said shaft and directly fitted on the portion of said shaft in the outsides of said side plates;

an ink-absorbed member incorporated in said further recess of said bridge;

an endless belt-like stamping member mounted around said cylinder means and said ink-absorbed member, made of a porous elastic material and having a number of character portions formed on the outer surface thereof, said endless belt-like stamping member being mounted between said flanges on said cylinder means and being equipped on the inner surface thereof with grooves spaced-apart to the same degree as said ridges to mate with respective ones of said ridges, said endless belt-like stamping member being of the same width as a distance between said flanges thus allowing said belt-like stamping member to lay smoothly over said cylinder and wherein said belt-like stamping member is always maintained in alignment by said flanges and said cooperating grooves and ridges;

a pair of covers, for covering the front and back portions of said frame, respectively;

a cap so disposed as to be capable of moving up and down along the outer surfaces of said side plates of said frame and the outer surfaces at the lower portions of said covers;

said spring means normally pushing said cap downwardly so that the surface of one of said character portions is pulled into said cap when one character portion reaches the lowermost position due to the rotation of said operating means, and allowing the surface of said one character portion to protrude outwardly from said opening of said cap thereby to effect stamping when said cap is pressed against an article to be stamped against the force of said spring means;

the improvement wherein said cylinder comprises a unitary element; each of said flanges having knurls around the outer circumference thereof, and said top plate having on a surface thereof downwardly directed elastic plates having on lower ends thereof pawls engaging said knurls on each of said flanges enabling rotation of said cylinder in small increments.

4,411,193

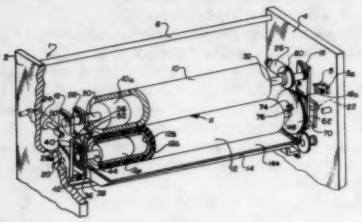
ROLLER GEAR DRIVE

Max W. Hess, North Richland Hills, Tex., assignor to Dahlgren Manufacturing Company, Dallas, Tex.

Filed May 26, 1981, Ser. No. 266,895
Int. Cl.³ B41F 7/26, 7/36, 7/40
U.S. Cl. 101—148 **3 Claims**

1. In a liquid metering device wherein first and second rollers are urged into pressure indented relation to form a metering nip, liquid being transferred to the metering nip by the second of the pair of rollers, the improvement comprising: a drive gear rotatable relative to said second roller; a first drive pin on the drive gear; a second pin connected to said second roller, said first pin being disposed to engage the second pin to limit rotation of the drive gear relative to the second roller; and a driven gear secured to said first roller, said driven gear being disposed in meshing relation with said drive gear such that initial rotation of said drive gear imparts rotation through said

driven gear for rotating said first roller and said second roller such that adjacent surfaces of the first and second roller move in the same direction at substantially equal surface speeds until

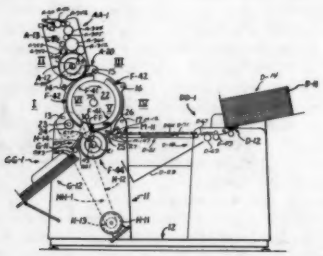


said first pin engages said second pin to cause adjacent surfaces of the first and second rollers to move in the same direction at different surface speeds.

4,411,194
PRINTING PRESS

William W. Davidson, Jr., Port Washington, N.Y., assignor to North Shore Precision Research Corporation, Ossining, N.Y.

Division of Ser. No. 866,778, Jan. 3, 1978, Pat. No. 4,231,291, which is a division of Ser. No. 498,844, Aug. 19, 1974, Pat. No. 4,098,185, which is a division of Ser. No. 235,221, Mar. 16, 1972, Pat. No. 3,848,320, which is a continuation-in-part of Ser. No. 73,161, Sep. 17, 1970, abandoned, which is a continuation-in-part of Ser. No. 658,385, Aug. 4, 1967, abandoned. This application Jul. 16, 1980, Ser. No. 169,526
Int. Cl.³ B41F *13/00, 21/00*
U.S. Cl. 101—216 **10 Claims**



1. In a printing press having a rotating shaft for supporting a print cylinder;

at least a first and a second cam, spaced longitudinally on said shaft and extending radially outward thereof for controlling functions of said printing press upon rotation of said shaft,

said first cam including a first and a second slot means spaced radially outwardly of said shaft,

said second cam including a first and a second slot means spaced radially outwardly of said shaft; and

means for securing each cam to rotate with said shaft, yet permitting selective circumferential adjustment of the position of each cam on said shaft independent of each other cam on said shaft;

said securing means including a radial disk mounted to rotate with said shaft and positioned on one side of said first cam facing away from said second cam,

first fastener means extending through said first slot means of both of said first and second cams for securing said first cam in a selected circumferential position to rotate with said disk,

second fastener means extending through said second slot means of both said first and second cams for securing said second cam in a selected circumferential position to rotate with said disk,

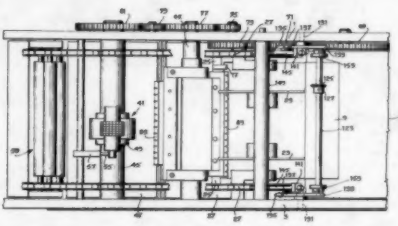
said second fastener means including a spacer extending through said second slot means of said first cam for maintaining said second cam in longitudinally spaced relation to said first cam on said shaft, and

both said first and second fastener means including means for loosening or tightening the same accessible from one side of said second cam facing away from said first cam.

4,411,195
PRINTING PRESS WITHIN TEAR-LINE TRACING MEANS

Christian Tailleux, Ste-Anne des Plaines, and Jacques Charbonneau, Brossard, both of Canada, assignors to Multidick Inc., Montreal, Canada

Filed Jan. 12, 1982, Ser. No. 338,898
Int. Cl.³ B41F *13/56*
U.S. Cl. 101—226 **12 Claims**



1. A printing press including a printing section delivering printed sheets onto a conveying section at a receiving station of said conveying section, said conveying section incorporating a horizontally movable conveyor provided with means for gripping said printed sheets discharged from said receiving station and moving them away from said receiving station, said printing press being characterized by the provision in combination therewith of means for producing tear-lines on said printed sheets, said means comprising:

a rotary shaft disposed transversely of and above said conveyor, adjacent to and downstream of said receiving station

a first tear-line tracer assembly fixedly mounted on said shaft, said first tracer assembly projecting radially from and lengthwise of said shaft and including a first tracer blade having an elongated serrated straight cutting edge extending parallel to the shaft rotation axis, said serrated cutting edge being adapted to produce tear-lines when applied over and across said printed sheet material as said sheet material is moved by said conveyor;

a second tracer assembly adjustably mounted on the rotary shaft, said second tracer assembly projecting radially and comprising a second tracer blade having an elongated straight serrated cutting edge extending parallel to the shaft rotation axis, said serrated cutting edge being adapted to produce tear-lines when applied over and across said printed sheets as said sheets are moved by said conveyor, and means for adjustably mounting said second blade on said shaft to position said second blade at a selected angle with respect to the blade of said first tear-line tracer assembly,

a rotary support roll beneath said conveyor and over the top of which said printed sheets bear as they are moved by said conveyor, the axes of rotation of said shaft and of said support roll lying in a common vertical plane;

means in said first and second tear-line assemblies to adjust the cutting edges of their respective blades, when lying in said vertical plane, with respect to the top of said support roll to ensure production of said tear-lines on said printed sheets when the latter move therebetween, and

means for synchronizing the rotation of said rotary shaft and said support roll with the movement of said conveyor to produce said tear-lines on the printed sheets at a selected location thereon,

wherein said means adjustably mounting said second tracer assembly on said shaft comprises:

a blade holding plate having a length greater than said second blade to define portions projecting away from the ends of said second blade;

means adjustably clamping said plate and blade together to allow relative displacement of said blade and plate transversely thereof;

two-part clamping collars and means securing said collars on said shaft;

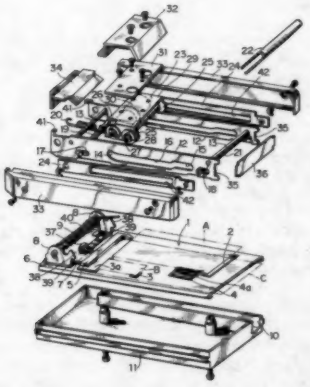
wherein one part of each of said collars has a holding finger projecting away from said rotary shaft when said collars are secured thereto, said holding fingers being constructed to receive said projecting portions of said blade and means fixing said holding plate to said holding fingers whereby said second blade, through said holding plate and collars, may be positioned on said shaft at said selected angle.

4,411,196

IMPRINTER WITH LOCKING AND RELEASING DEVICE

Keizo Kubo, Hachioji, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan

Filed Feb. 12, 1982, Ser. No. 348,454
Claims priority, application Japan, Feb. 24, 1981, 56-24860
Int. Cl.³ B41F *3/20*
U.S. Cl. 101—269 **4 Claims**



1. In an imprinter with a locking and releasing device, having an elongated printing bed and a carriage supporting a printing roller and mounted on the printing bed for moving thereacross by means of guide rollers of the carriage to imprint a form with the types arranged on the printing bed, said carriage being turnable to and away from the printing bed between an operative position in which the carriage is on the printing bed and an inoperative position in which the carriage is away from the printing bed, the improvement comprising:

support means (**7**) including a pair of upright portions (**8**) projecting outwardly from the printing bed and spaced from each other, each of said upright portions being formed with an inclined edge (**38**) and a vertical edge (**39**) forming a carriage locking structure;

a unit of guide frames (**12**) each mounted at one end thereof on the support means for carrying the carriage thereon and turnable to and away from the printing bed, said guide frames being each formed with an elongated guide groove (**16**) for engaging each of the guide rollers of the carriage, said guide frames being each further formed with first and second grooves (**17, 18**) opposite to each other with respect to the elongated guide groove;

engaging means including a first transverse shaft (**19**) having both ends engaging the first grooves of the guide frames, respectively and being movable with respect to the latter;

actuating means including a second transverse shaft (**21**) having both ends engaging the second grooves of the guide frames, respectively and being movable with respect to the latter;

means (**24, 24**) for connecting the first and second transverse shafts to each other;

swingable means (**22**) mounted on the unit of guide frames and engaging the second transverse shaft (**21**), so that the swingable means may be moved in association with the first and second transverse shafts;

first spring means (**20**) normally biasing the first and second transverse shafts in one direction to hold the first transverse shaft in cooperation with the carriage locking structure of said support means when the carriage and the unit of guide frames are in the operative position of the printing bed; and

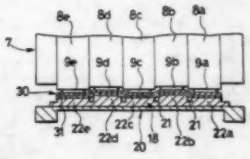
second spring means (**40**) normally biasing the unit of guide frames together with the carriage toward the inoperative position away from the printing bed, said swingable means being adapted to move in a direction to release the first transverse shaft and accordingly the unit of guide frames from the locking structure of said support means when the carriage is moved to a position for swinging the swingable means at the end of printing operation, and said second spring means moving the unit of guide frames together with the carriage into the inoperative position away from the printing bed.

4,411,197

PRINTING DEVICE FOR HAND LABELER

Yo Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Sato Kenkyusho, Japan

Filed May 24, 1982, Ser. No. 381,547
Claims priority, application Japan, Aug. 14, 1979, 54-111220
Int. Cl.³ B41K *1/10*; B41J *11/20*
U.S. Cl. 101—291 **8 Claims**



1. A printing device for printing a plurality of types on an imprintable medium, comprising:

a printing head having a plurality of types, the plurality of types comprising a plurality of rotatable means with each rotatable means carrying a respective series of types and each rotatable means being rotatable to move a respective type of the respective series to a printing position; at the printing position, the types of each of the rotatable means then at the printing position together define a printing surface on which the types are positioned for engaging an imprintable medium;

a platen for supporting an imprintable medium and including a type receiving plate positioned for being contacted by the types of the printing surface;

means mounting all of the rotatable means for movement together as one unit, and means for moving all of the rotatable means and the types thereof then on the printing surface toward and simultaneously against the type re-

ceiving plate for imprinting an imprintable medium on the plate;

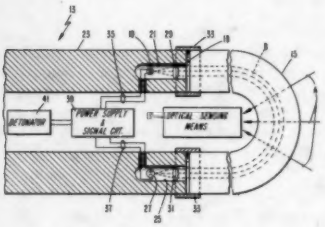
the type receiving plate being comprised of a plurality of independent lands, corresponding in position to respective ones of the types on the printing surface; each type is to be contacted and the top surface together being generally planar; each of the lands being independently elastically deformable for establishing a generally uniform printing pressure for each of the types against a respective land when the types simultaneous contact the lands; said plate having a general orientation and the top surfaces of said lands being sloped in orientation with respect to said plate for matching the slopes of the imprintable surfaces of said types.

4,411,198

IMPACT FUZE

John E. Shrader, Mercer Island, and Alan B. Zimmerschied, Renton, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 24, 1981, Ser. No. 247,076
Int. Cl.³ F42C *19/06*
U.S. Cl. 102—216 **11 Claims**



1. An impact fuze for use in a warhead assembly having a nose made of optically transparent material comprising:

(a) light generating means for producing a light beam,

(b) light receiving means,

(c) said light generating means and said light receiving means spacedly positioned from one another for enabling said light beam to travel from said light generating means, through a path in said optically transparent nose material and to said light receiving means, and

(d) circuit means coupled to said light receiving means for producing a signal upon the detection of an abrupt change in sensed light by said light receiving means.

4,411,199

BOOSTER FOR MISSILE FUZE WITH CYLINDRICAL WALL HOLES

Patrick A. Yates, China Lake, Calif., and Patrick M. McInnis, Garderville, Nev., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 30, 1981, Ser. No. 248,932
Int. Cl.³ F42C *15/06*
U.S. Cl. 102—481 **13 Claims**

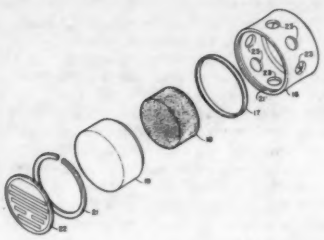
1. A booster for a missile warhead detonation system comprising:

a sleeve having cylindrical walls and a shouldered open end and an open end and a plurality of apertures extending through said cylindrical walls;

a metallic cup fitting within said sleeve to be sealingly supported by said shouldered open end;

a booster explosive charge fitting in and supported by said metallic cup in alignment with said plurality of apertures in said sleeve wall;

a nonmetallic cup fitted within said sleeve and in cooperative arrangement with said metallic cup enclosing said booster charge and dimensioned to extend in proximate alignment with the open end of said sleeve; and



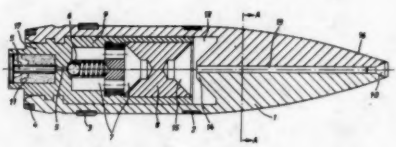
means connected to the open end of said sleeve for retaining said metallic cup, said booster charge, and said nonmetallic cup within said sleeve.

4,411,200

SHORT TRAJECTORY ROUND

Uwe Brede; Horst Penner; Rudolf Stahlmann, all of Fürth, and Erich Zeiher, Fürth-Vach, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Aug. 14, 1978, Ser. No. 946,042
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1977, 2736529
Int. Cl.³ F42B *13/20*
U.S. Cl. 102—529 **24 Claims**



1. A short range trajectory round having an aerodynamic resistance which sharply increases at a predetermined time after discharge of the round from a barrel of a weapon comprising a body having a longitudinal axis and a forward tip portion and a rear base portion, at least one segment means forming a part of the body, at least a portion of the at least one segment means being arranged for outward movement away from the longitudinal axis, the at least one segment means at least partially delimiting an inner cavity within the body terminating at a predetermined distance from the tip portion, and plunger means having a forward portion and a rearward portion disposed within the cavity and arranged for movement in the longitudinal direction of the round between at least a rearward position and a forward position, the plunger means being movable to the forward position in response to the firing of the round for form-lockingly engaging the at least one segment means to prevent movement of the portion of the at least one segment means away from the longitudinal axis of the round thereby to establish a first aerodynamic resistance for the round, the plunger means being movable toward the rearward position in response to a force acting on the forward portion thereof after discharge of the round from the barrel of the weapon for disengaging the at least one segment means to enable outward movement of the portion of the at least one segment means with respect to the longitudinal axis of the round and thereby establish at least a second aerodynamic resistance for the round which is greater than the first aerodynamic resistance.

23. A short range trajectory round having an aerodynamic

resistance which sharply increases at a predetermined time after discharge of the round from a barrel of a weapon comprising a body having a longitudinal axis, at least one segment means forming a part of the body, at least a portion of the at least one segment means being arranged for outward movement away from the longitudinal axis, connector means cooperating with the at least one segment means for establishing a temporary connection between the at least one segment means and other portions of the body in response to the firing of the projectile to prevent movement of the portion of the at least one segment means away from the longitudinal axis of the round thereby to establish a first aerodynamic resistance for the round, and delay means for enabling termination of the temporary connection established by the connector means at a time after discharge of the round from the barrel of the weapon so as to enable outward movement of the portion of the at least one segment means with respect to the longitudinal axis of the round and thereby establish at least a second aerodynamic resistance for the round which is greater than the first aerodynamic resistance, and wherein the body is formed of a plurality of segment means configured to delimit an inner cavity within the body, the connector means being arranged within the cavity for establishing a temporary connection with the segment means in response to a force acting thereon and generated by the firing of the round.

4,411,201

RAILWAY CAR DIAPHRAGM CONSTRUCTION

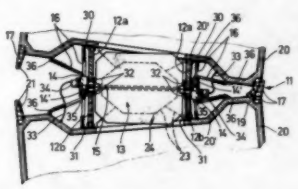
Helmut Hassel, Donauwörth, and Reimund Stark, Griesbeckerzell, both of Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Jun. 8, 1981, Ser. No. 271,184

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1980, 3024635

Int. Cl.³ B60D *5/00;* **B61D** *17/14, 17/22*

U.S. Cl. 105—8 R **8 Claims**



1. A bridging structure for vehicles, comprising a first flexible tunnel section, first means (**30**) securing said first tunnel section to its respective vehicle end in a sealing manner, a second flexible tunnel section (**12***b*), second means (**31**) securing said second tunnel section (**12***b*) to its respective vehicle end in a sealing manner, flexible sealing joint means (**32**) all around a facing end of each tunnel section for sealing the tunnel sections to each other, interlocking means (**14, 14'**) operatively arranged for locking the first and second tunnel sections (**12***a,* **12***b*) to each other to maintain a continuous seal all around between the two tunnel sections, said bridging structure further comprising elastic suspension means (**16**) on each vehicle, first pivot means (**35**) for pivoting said suspension means (**16**) to each of said first and second tunnel sections (**12***a,* **12***b*) and second pivoting means (**36**) pivoting said suspension means to a respective vehicle section, said elastic suspension means comprising damping means for damping any movements of said first and second tunnel sections (**12***a,* **12***b*), said elastic suspension means being arranged in pairs so that at least one pair of elastic suspension means is provided on each side of the respective tunnel section, and so that the elastic suspension means forming a pair are arranged at an angle relative to each other.

4. A bridging structure for vehicles, comprising two flexible cooperating sectional members (**17**), connecting means (**18, 19,** **19***a*) at each vehicle end corner adjacent to an outer shell wall thereof for connecting the respective sectional member to the corresponding vehicle end in such a position that a substantially streamlined continuity is provided for and between two outer shell walls of adjacent vehicles, wherein said flexible cooperating sectional members (**17**) are constructed as inflatable multichamber hollow sections, said hollow sections extending at least partially around an end edge of a vehicle section, wherein said connecting means comprise a steel core (**19**) attached to said multichamber hollow sections (**17**) and groove means (**18**) around an end corner of a vehicle section into which said steel core of the respective hollow section is clamped with a press fit, wherein said connecting means further comprise tensioning means (**22**) operatively connecting said steel core (**19**) to an end of a vehicle section for securing said multichamber hollow section in a tension adjustable manner, and air pressure supply means (**25,25'**) operatively connected to said inflatable multichamber hollow sections (**17**) for positively controlling the pressure in said hollow sections (**17**).

6. A bridging system for vehicles, comprising a first bridging structure including a first flexible tunnel section (**12***a*), first means (**30**) securing said first tunnel section to its respective vehicle end in a sealing manner, a second flexible tunnel section (**12***b*), second means (**31**) securing said second tunnel section (**12***b*) to its respective vehicle end in a sealing manner, flexible sealing joint means (**32**) all around a facing end of each tunnel section for sealing the tunnel sections to each other, and interlocking means (**14, 14'**) operatively arranged for locking the first and second tunnel sections to each other to maintain a continuous seal all around between the two tunnel sections, whereby the first bridging structure performs primarily a sealing function, and elastic suspension means (**16**) for suspending said first bridging structure, said elastic suspension means being arranged in pairs so that at least one pair of elastic suspension means is provided on each side of the respective tunnel section, and so that the elastic suspension means forming a pair are arranged at an angle relative to each other, said system further comprising a second bridging structure including two flexible cooperating sectional members (**17**), connecting means (**18, 19, 19***a*) at each vehicle end corner adjacent to an outer shell wall thereof for connecting the respective sectional member to the corresponding vehicle end in such a position that the second bridging structure provides a substantially streamlined transition for and between two outer shell walls of adjacent vehicles, said sectional members (**17**) having inflatable chambers, and air pressure supply means (**25**) operatively connected to said inflatable chambers for positively controlling the air pressure in said chambers, said sectional members of two adjacent vehicles facing each other when the vehicles travel along a straight path, said sectional members of two adjacent vehicles sliding alongside and in parallel to each other on the inner side of a curve substantially in parallel to a longitudinal vehicle axis.

4,411,202

RAIL VEHICLE

Ernst F. Kreissig, Seuzach, Switzerland, assignor to Schweizerische Lokomitiv-und Maschinenfabrik, Winterthur, Switzerland

Filed Jul. 7, 1980, Ser. No. 166,098

Claims priority, application Switzerland, Jul. 11, 1979, 6454/79

Int. Cl.³ B61F *3/04, 5/02, 5/50*

U.S. Cl. 105—199 R **4 Claims**

1. A rail vehicle comprising

a body having a longitudinal center plane, a transverse center plane, and a center of gravity on said transverse center plane;

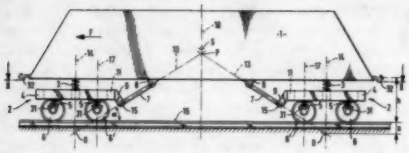
a pair of bogies supporting said body thereon, each said bogie having a pair of wheel sets thereon; and

a pair of rods disposed symmetrically of said transverse center plane for transmitting traction and braking forces between said bogies and said body, each said rod being

angularly disposed in said longitudinal center plane and having one end articulated to said body and an opposite end articulated to a respective one of said bogies, each said rod having a longitudinal axis with an imaginary extension intersecting a transverse center plane of said respective bogie at a point below said wheel sets to impart a forward pitching moment on said leading bogie and thereby increase the loading of the leading axle of the leading bogie relative to the direction of movement of the vehicle and wherein said longitudinal axes of said inclined rods intersect said transverse center plane of said body at a point near said center of gravity to preclude transmission of a body pitch to said bogies.

4. A rail vehicle comprising

a body having a longitudinal center plane, a transverse center plane, and a center of gravity on said transverse center plane;



a pair of bogies supporting said body thereon, each said bogie having a pair of wheel sets with each wheel set including an axle; and

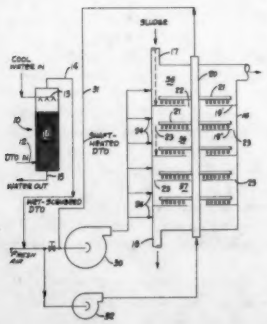
a pair of rods disposed symmetrically of said transverse center plane for transmitting traction and braking forces between said bogies and said body, each said rod being angularly disposed in said longitudinal center plane and having one end articulated to said body and an opposite end articulated to an axle of a respective one of said bogies, each said rod having a longitudinal axis with an imaginary extension intersecting a transverse center plane of said respective bogie at a point below said wheel sets with said longitudinal axes of said inclined rods intersecting said transverse center plane of said body at a point near said center of gravity.

4,411,203

PROCESS FOR UTILIZING LOW CALORIFIC VALUE OFF-GASES AND SIMULTANEOUS DEODORIZATION THEREOF

Frederick M. Lewis, Mountain View, Calif., assignor to Sterling Drug Inc., New York, N.Y.

Filed Jun. 8, 1982, Ser. No. 386,433
Int. Cl.³ F23J *3/00*
U.S. Cl. 110—341 **8 Claims**



1. In a waste disposal process, including settling suspended solids from sludge which has been conditioned to make it dewaterable, optionally thermally conditioning said sludge to aid dewatering thereof, removing a malodorous off-gas evolved from said sludge during treatment thereof, dewatering said sludge, and incinerating the dewatered sludge in a multiple hearth furnace provided with a rotatable central shaft and rabbling arms connected for rotation therewith, which arms are internally in open flow communication with said central shaft through which shaft-cooling gas is flowed, the improvement comprising,

(a) wet-scrubbing said malodorous off-gas having a heating value less than about 100 BTU/ft^3, so as to provide a wet-scrubbed stream at a temperature within the range from about 32° F. to about 90° F.;

(b) passing said wet-scrubbed stream, in a major proportion by volume of said shaft-cooling gas, through said central shaft so as to provide shaft-heated gas at a temperature above 212° F. but below about 600° F.; and,

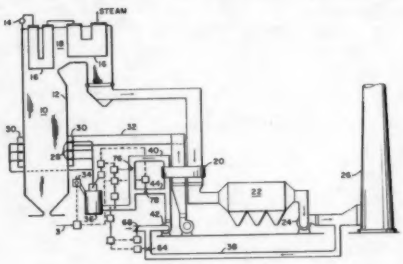
(c) ducting said shaft-heated gas into said furnace's combustion zone to provide pre-heated gas to assist in incineration of said sludge, said simultaneously to assist in deodorization of said shaft-heated gas.

4,411,204

METHOD OF FIRING A PULVERIZED FUEL-FIRED STEAM GENERATOR

Thomas B. Hamilton, Farmington, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Dec. 7, 1981, Ser. No. 327,844
Int. Cl.³ F23D *1/00*
U.S. Cl. 110—347 **3 Claims**



1. In a steam generator for burning pulverized fuel having a mill for pulverizing the fuel, a furnace wherein the fuel is burned thereby generating hot flue gas, steam heating surface disposed downstream of the furnace in the flow path of the hot flue gas leaving the furnace whereby heat is transferred from the hot flue gas thereby cooling the flue gas traversing said steam heating surface, a particle collector disposed downstream of the furnace wherein particles entrained in the flue gas are removed therefrom, and a fan disposed downstream of said heating surface and said particle collector for boosting the pressure of the cooled clean flue gas before it is vented to the atmosphere, a method of firing said steam generator comprising:

a. feeding solid fuel to the mill for pulverizing therein at a controlled rate in response to load demand on the steam generator;

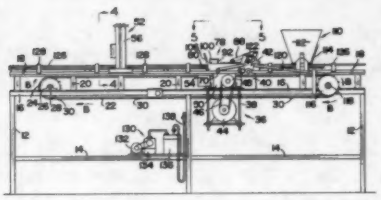
b. recirculating a portion of the cooled clean flue gas leaving said booster fan to the mill;

c. mixing ambient air into the recirculated flue gas before introducing the gaseous mixture thereof into the mill;

d. conveying the fuel pulverized in the mill to the furnace entrained in said gaseous mixture of recirculated flue gas and air;

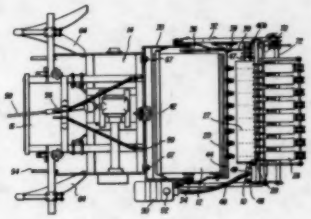
e. controlling the volume flow rate of said gaseous mixture to the mill in response to the feed rate of fuel to the mill;
f. measuring the oxygen content of said gaseous mixture of recirculated flue gas and air entering the mill; and
g. controlling the volume flow rate of recirculated flue gas and the volume flow rate of air with respect to each other in response to said oxygen measurement so as to maintain the oxygen level in said gaseous mixture entering the mill at a level of at least 12% by volume.

4,411,205
SEED PLANTER
James T. Rogers, Rt. 1, Box 253, Dover, Fla. 33527
Filed Sep. 30, 1982, Ser. No. 431,780
Int. Cl.³ A01C *5/04*
U.S. Cl. 111—1 **15 Claims**



1. An automatic seed planter of the type primarily intended for depositing seeds into prepared growing medium in a seedling flat, said seed planter comprising: a support frame including conveyor means mounted thereon for transporting a seedling flat along the longitudinal dimension of the top of said frame; drive means mounted on said frame and operatively connected to said conveyor means; dibbler means mounted on said frame above said conveyor means and operatively connected to said drive means, whereby a seedling flat containing growing medium may pass under said dibbler means and said dibbler means will be actuated by said drive means to prepare a receptacle in the growing medium for seed; and seed delivery means mounted on said frame above said conveyor means downstream of said dibbler means, said seed delivery means comprising a seed frame mounted in substantially transverse relation to said top of said support frame; a delivery plate mounted on said seed frame in substantially parallel, spaced apart relation to said top of said support frame and including a plurality of delivery apertures formed through said delivery plate, each one of said plurality being in substantial registry with a receptacle prepared by said dibbler means; a transfer plate movably mounted in juxtaposition above said delivery plate and including a corresponding plurality of transfer apertures formed therethrough, each one of said plurality being in substantial registry with a corresponding one of said delivery apertures when said transfer plate is moved from a first position to a second position, said transfer plate being operatively connected to said drive means for reciprocal movement with respect to the longitudinal dimension of said support frame top; a seed hopper mounted on said seed frame above said transfer plate, the bottom of said hopper communicating with the top of said transfer plate such that said first position is defined by placement of said transfer apertures beneath said hopper bottom and said second position is defined by placement of said transfer apertures in registry with said delivery apertures; and said seed delivery means further comprising a plurality of guide fingers mounted on said seed frame in substantially transverse relation to said support frame top, each of said plurality of guide fingers including a distal end disposed in spaced apart registry with one of said delivery apertures and disposed in engaging registry with one of said transfer apertures when said transfer plate is in its second position, whereby each one of said distal ends will assist in causing a seed carried within a corresponding one of said transfer apertures to fall therefrom, through the corresponding one of said delivery apertures, and into the receptacle prepared in the seedling flat by said dibbler means.

4,411,206
PRECISION SOWER
Donald C. Hiscock, Rotorua, New Zealand, assignor to Development Finance Corp of New Zealand, Wellington, New Zealand
Filed Jul. 20, 1981, Ser. No. 284,813
Int. Cl.³ A01C *7/04*
U.S. Cl. 111—34 **7 Claims**

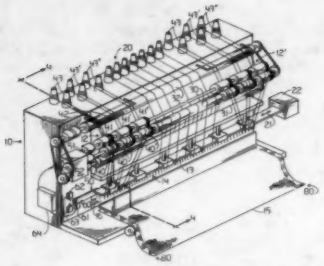


1. A precision seed sowing apparatus comprising:
a rotatable drum mounted in use to roll over roll in which seeds are to be sown,
regularly spaced orifices passing through the circumference of said drum, each said orifice lying in a common plane perpendicular to the axis of said drum,
means for receiving a source of vacuum in the interior of said drum whereby the pressure at the radially interior end of said orifices is lower than at the exterior end,
seed feeding means exterior to said drum and cooperable with said orifices,
seed discharging means cooperable with said orifices, said discharging means comprising:
pins, each of which is aligned with a said orifice, said pins being mounted on bar members, each said bar member being substantially parallel with the longitudinal axis of said drum,
a pair of disc members each having a plurality of radial guideways, one disc member being adjacent each end of said drum, each of said bar members being slideable radially inwardly and outwardly within each said guideway, said discs and bars being rotatable with said drum,
biasing means biasing each said bar inwardly so that at rest each said pin is positioned radially inward from its corresponding orifice, and,
cam means fixed relative to said drum and having a first striking surface and a second striking surface in the path of travel of a striking surface of each said bar, the first striking surface being positioned so that contact with the striking surface of said bar advances said bar against said biasing means directly radially outwardly whereby the row of pins on said advanced bar passes through the aligned row of orifices to dislodge seeds along said row of orifices, said first cam surface being positioned to advance said bar at or near the bottom-most point of rotation of said drum, said second striking surface being positioned so that contact is maintained with the striking surface of said bar after it has passed said first striking surface to maintain said row of pins on said bar within said orifices until said row of orifices has rotated clear of said soil over which the drum is travelling, said biasing means returning each said bar to its rest position after its striking surface has passed said second cam striking surface.

4,411,207
YARN SAVING METHOD AND APPARATUS

James D. Brock, Chattanooga, Tenn., and Gerald B. Morrison, Dalton, Ga., assignors to Tuftec, Inc., Dalton, Ga.

Filed Apr. 22, 1982, Ser. No. 370,981
Int. Cl.³ D05C *15/32, 15/28*
U.S. Cl. 112—79 A 13 Claims



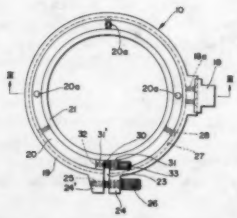
1. In a tufting machine including means for advancing a web of backing material, a plurality of needles mounted in an elongate needle bar reciprocable toward and away from said backing material, said needles threaded with yarn for piercing said backing material, means for feeding yarn to said needles at a speed related to the advancement of said backing material and the reciprocation of said needles, and means for shifting said needle bar laterally with respect to said backing material, the improvement comprising:

means for slowing the speed at which said yarn is fed to the outermost needle at the outwardly moving end of said needle bar as said needle bar is shifted laterally, until said needle bar returns to its original position.

4,411,208
EMBROIDERY FRAME FOR AUTOMATIC EMBROIDERY MACHINE

Koji Nishida, and Taneichi Kawai, both of Anjo, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 4, 1981, Ser. No. 289,994
Claims priority, application Japan, Aug. 5, 1980, 55-107322; Sep. 18, 1980, 55-133011
Int. Cl.³ D05C *1/04, 7/04, 9/06*
U.S. Cl. 112—103 7 Claims



1. An embroidery frame for an embroidery machine having a traveller comprising:

an annular outer frame member with an adjustable circumference, said outer frame member having mounting means for removably securing the outer frame member to the traveller of the machine,

an annular intermediate frame member with an adjustable circumference, said intermediate frame member being sized to fit within the outer frame member along the inner periphery of the outer frame member,

an inner frame member, said inner frame member being sized to fit within the intermediate frame member along the inner periphery of the intermediate frame member,

first adjusting means on the intermediate frame member for adjusting the circumference of the intermediate frame member to releasably clamp the intermediate frame member against the inner frame member so that a cloth to be embroidered can be held firmly between the inner frame member and the intermediate frame member,

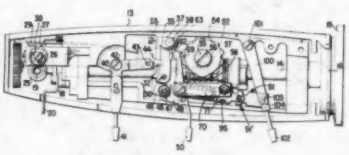
alignment means for holding the intermediate frame member within the outer frame member while still permitting the intermediate frame member to rotate relative to the outer frame member so that, when the outer frame member is mounted on the machine, the intermediate and inner frame members, and any cloth held by those members, can be freely rotated to properly orient the frame members and cloth relative to the machine, and

second adjusting means of the outer frame member for adjusting the circumference of the outer frame member to releasably clamp the outer frame member against the intermediate frame member so that all frame members and any cloth held by the frame members are fixed relative to the machine's traveller.

4,411,209
CAM SELECTOR MECHANISM FOR SEWING MACHINES

Jan Szostak, Lincroft, and Henry Schaeflern, Pittstown, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Jul. 6, 1982, Ser. No. 395,527
Int. Cl.³ D05B *3/02*
U.S. Cl. 112—158 A 4 Claims



1. A pattern cam selector mechanism for a needle jogging mechanism in the frame of a zig zag sewing machine employing a control block slidably supported for movement relatively to said sewing machine frame, a manually influenced actuating member in said sewing machine operatively connected to said control block, cam surfaces formed on said control block, and pattern cam selector linkage means responsive to said cam surfaces, the improvement in which said cam surfaces include a pair of substantially identically shaped cam tracks arranged laterally opposite each other in mirror image relation on said control block, said pattern cam selector linkage means arranged in tracking relation with one of said cam tracks, and an abutment pin carried on said sewing machine frame and arranged in tracking relation with the other of said cam tracks at a point along said cam track which is in substantial mirror image relation with that tracked by said pattern cam selector linkage means.

4,411,210
ACTUATING MECHANISM FOR A DOUBLE POINTED LOOPER IN A SEWING MACHINE

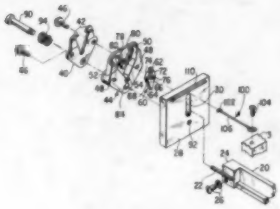
Karl H. Killinger, Dover, N.J., assignor to The Singer Company, Stamford, Conn.

Filed Dec. 17, 1981, Ser. No. 331,699
Int. Cl.³ D05B *57/02, 97/02, 97/10*
U.S. Cl. 112—199 4 Claims

1. A sewing machine having a frame, a thread carrying needle arranged for reciprocating motion in said frame, a looper having two loop seizing points and arranged for pivotal motion in said frame, and an actuating means for effecting said

motions thereby alternately placing each of said two loop seizing points into cooperative engagement with said needle in the formation of chain stitches, wherein said actuating means comprises:

a. a guide member having an elongated guide channel;
b. an actuating member constrained in said elongated guide channel;
c. means for imparting reciprocatory motion to said actuating member along said elongated guide channel;
d. a cam rigidly attached to said looper, said cam having two intersecting cam tracks;



e. cam follower means associated with said actuating member and arranged in sliding engagement with said cam tracks; and
f. a gate means for alternately blocking each of said two intersecting cam tracks so that said cam follower will slidingly engage the other of said two intersecting cam tracks thereby effecting pivotal motion of said looper alternately placing each of said two loop seizing points into cooperative engagement with said needle.

4,411,211

METHOD OF AND APPARATUS FOR ATTACHING SLIDE FASTENER COUPLING CHAINS TO A FLEXIBLE SUPPORT

Halmüt Heimberger, Steinhausen, Switzerland, assignor to Optilon W. Erich Heilmann GmbH, Cham, Switzerland

Filed Oct. 22, 1981, Ser. No. 314,047

Claims priority, application Fed. Rep. of Germany, Oct. 25, 1980, 3040286

Int. Cl.[3] **D05B** *97/10, 29/06, 27/04*

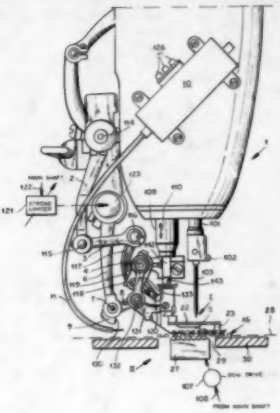
U.S. Cl. 112—265.2 **10 Claims**

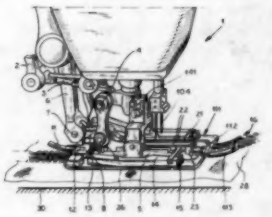
1. A method of securing a slide fastener coupling chain to a flexible support, comprising the steps of:

(a) incrementally advancing said support past a stitching location;
(b) feeding said coupling chain to said support and said stitching location and incrementally advancing said coupling chain past said location;
(c) sewing said coupling chain to said support at said location by repeatedly passing a sewing needle between coupling heads of said chain and through said support at said location synchronously with the increment feeds of said support and said coupling chain; and
(d) controlling the displacement per increment of feed of at least one of said incremental feeds to ensure flat, corrugation-free contact of the coupling chain with the support to which it is stitched at least after washing or ironing treatment thereof.

6. An apparatus for sewing a coupling chain to a flexible support comprising:

a sewing machine table provided with a fabric-feed mechanism for advancing said support past a stitching location;
a sewing machine head overhanging said table and provided with reciprocatable needle bar displacing a needle through said support at said location in synchronism with said mechanism;
a biased presser foot mounted on said head and riding on said support at said location;
a transport foot on said presser foot engageable with a coupling chain for advancing same past said location for stitching of said coupling chain to said support by said needle;
a chain-feed mechanism synchronized with said needle bar for incrementally displacing said chain past said location;





and

control means operatively connected to one of said mechanisms for varying the displacement increment thereof to ensure flat contact of said chain and said support upon the stitching of said chain to said support.

4,411,212

APPARATUS FOR REDUCING ROLL AND PITCH MOTIONS OF FLOATING VESSELS

Gunnar B. Bergman, Montecito, Calif., assignor to SeaTek, Goleta, Calif.

Continuation of Ser. No. 45,615, Jun. 5, 1979, abandoned, which is a continuation-in-part of Ser. No. 920,469, Jun. 29, 1978, abandoned. This application Mar. 13, 1981, Ser. No. 243,354

Int. Cl.[3] **B63B** *39/03, 39/06*

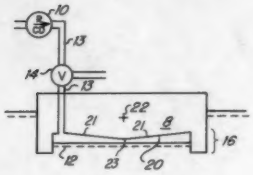
U.S. Cl. 114—125 **18 Claims**

1. Apparatus for reducing roll and pitch motion of a floating vessel having first and second modes of operation, said apparatus comprising:

a recessed cavity formed and symmetrically disposed in a substantial portion of the bottom of the hull of the vessel, said cavity having a bottom portion completely open to the water and having a top, corresponding to the bottom of the hull of the vessel, in the form of a dihedral extending the entire length of the cavity having an axis parallel to a transverse axis of the vessel;
conduit means coupled to the top of said cavity for providing air passageways thereto; and

means coupled to said conduit means for selectively providing air to the cavity to control the water level therein;

said water level in said cavity being selected to control the rate of change of the righting moment of the vessel by substantially reducing the natural roll and pitch righting moments thereof in the first mode of operation, and by substantially restoring the natural roll and pitch righting moments thereof in the second mode of operation;



said first and second modes of operation being determined by the water level in the cavity during roll and pitch motion of said floating vessel;

the top of the cavity being formed so that the water surface in the cavity contacts the top of the cavity at preselected values of roll and pitch inclination of the vessel.

4,411,213
TWIN-HULL WATERCRAFT

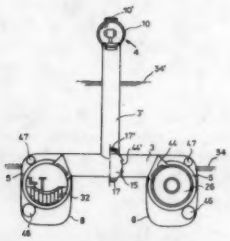
Günther R. Laukien, Silberstreifen, D 7512 Rheinstetten-Forchheim, Fed. Rep. of Germany

Filed Aug. 28, 1980, Ser. No. 182,471

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1979, 2938319

Int. Cl.³ B63H *8/00, 8/04, 8/22*

U.S. Cl. 114—312 **17 Claims**



1. A twin-hull watercraft comprising two hulls disposed parallel to and spaced apart from each other, said hulls being rigidly and directly interconnected by at least a pair of hollow tubular transverse struts lying substantially in the plane of said hulls, a vertical hollow tubular superstructure extending upwardly from and communicating with the interior of one of said transverse struts along substantially the central longitudinal plane between said hulls, a pilot's cab disposed on said superstructure, said hulls and said struts being designed as pressure-resistant buoyancy bodies in that their weight is less than the weight of water displaced by them, said hulls being designed as tight pressure vessels of the submarine type and being provided with cells that may be flooded and blown, said pilot's cab being a pressure vessel buoyancy body in that its weight is less than the weight of water it displaces in the submerged condition, said hulls, struts and pilot's cab arranged to be weight-stable in the fully submerged condition and in the partially submerged condition wherein the pilot's cab is at least partly above the mean waterline whereby said watercraft can be used both as a form-stable surface-bound watercraft and as a weight-stable semi-submersible craft or a weight-stable submersible craft, and at least one egress means provided in at least one of the transverse struts and the pilot's cab.

4,411,214
ROWING SCULL

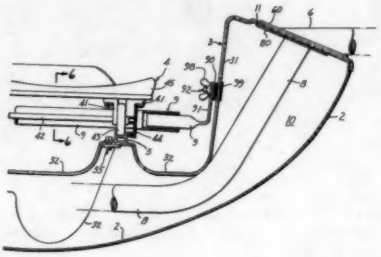
Kotaro Horiuchi, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 29, 1980, Ser. No. 221,052

Claims priority, application Japan, Dec. 29, 1979, 54-172716; Dec. 29, 1979, 54-172717

Int. Cl.³ B63B *35/72*

U.S. Cl. 114—347 **7 Claims**



1. A rowing scull comprising: a hull member comprising a bottom, a sidewall and a continuous edge around said sidewall, a cockpit member having a sidewall and a bottom and a deck member, said deck member having an inner opening and an outer edge, its outer edge being fully sealingly engaged to said hull edge, and a said cockpit member being fully and sealingly connected to said deck member around its said opening; a rigid frame member reinforcingly attached to said deck member at both sides of said cockpit member and extending beneath said cockpit member between said cockpit member and said hull member, without attachment to either the cockpit member or to said hull member whereby said deck member comprises a main strength member for said scull reinforced by said frame member; and a pair of outriggers, each being attached to the top of said deck member at a respective side of said cockpit.

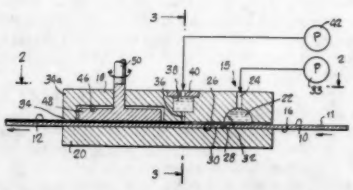
4,411,215
APPARATUS FOR PRODUCING STRIPED SURFACE COATINGS

J. Lynn Gailey, Newton Falls, and Carl A. Wollam, Cortland, both of Ohio, assignors to Alcan Aluminum Corporation, Cleveland, Ohio

Division of Ser. No. 226,705, Jan. 21, 1981, Pat. No. 4,356,216. This application Jun. 11, 1982, Ser. No. 387,491

Int. Cl.³ B05C *5/02*

U.S. Cl. 118—111 **5 Claims**



1. Apparatus for forming a continuous adherent coating layer on a major surface of a strip article, including

(a) means defining a path of longitudinal advance of said article, including an extended wall facing said major sur-

face of said article and so arranged that the advancing article moves longitudinally relative thereto;

(b) means at one end of said wall constituting a dam extending transversely of the path of article advance so as to be disposed in adjacent spaced relation to the article major surface facing said wall;

(c) means for supplying a first liquid coating material to the last-mentioned article major surface ahead of said dam, to establish thereon a continuous wet coating layer; and

(d) means for uniformly restraining said article against movement of said major surface away from said wall beyond a predetermined distance during advance of said article past said wall, equal to a desired thickness of said wet coating layer, such that said major surface and said wall mutually define a gap entirely filled by said wet coating layer across the width of said layer;

wherein the improvement comprises;

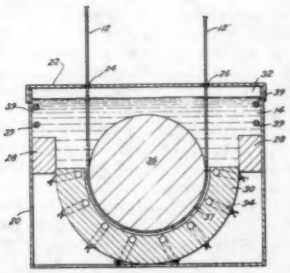
(e) means for delivering through said wall, to at least one locality in said gap, a second liquid coating material under pressure sufficient to displace locally the first liquid coating material in the wet coating layer, thereby to establish a stripe of the second liquid coating material in the wet coating layer, said means including an aperture in said wall at said one locality for admitting said second liquid coating material to said gap.

4,411,216

PRESSURE SATURATOR

Howard K. Menser, Plymouth, Ind., assignor to Miply Equipment Inc., South Bend, Ind.

Filed Nov. 12, 1981, Ser. No. 320,317
Int. Cl.³ B05C *3/12*
U.S. Cl. 118—117 **13 Claims**



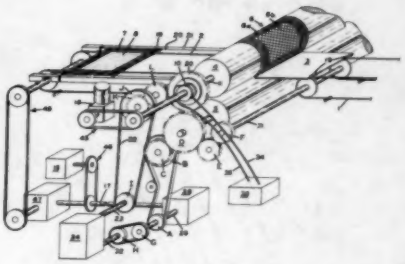
1. A pressure saturator for impregnating a porous substrate with a solid from a saturant solution, comprising a housing forming a reservoir for holding the saturant solution, a base member having an arcuate inner wall forming a depression in the bottom of said reservoir, a mandrel disposed in said reservoir with a portion thereof extending into said depression for guiding the substrate through the saturant solution, the perimeter of said portion of said mandrel being spaced from and in close proximity to said arcuate inner wall of said base member and, in combination with said inner wall, defining an unobstructed chamber the radial width of which is sufficiently narrow to produce by hydraulic action an increase in pressure of the solution therein as the substrate passes therethrough, and heating element means disposed in said base member for heating the saturant solution in said depression.

4,411,217

OVERRUNNING SYNCHRONIZABLE CLUTCH AND APPARATUS FOR TREATING WORK PIECES IN REGISTER WITH A PHYSICAL CHARACTERISTIC THEREOF

James P. Valenti, Lancaster, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Apr. 8, 1982, Ser. No. 366,241
Int. Cl.³ B05C *1/02*
U.S. Cl. 118—212 **6 Claims**



1. An apparatus for treating work pieces in register with a physical characteristic thereof, said work pieces being conveyed through said apparatus, comprising in combination:

(a) first and second conveying means for transporting the work pieces through said apparatus;

(b) means interposed between said first and second conveying means for treating the work pieces, comprising an upper rotary work piece-engaging member and a rotary back-up member therefor;

(c) first and second drive means for activating the conveying means and the work piece treating means operably connected by an overrunning, synchronizable clutch, for synchronizing the movement of said first and second conveying means and said work piece treating means, said clutch having

(1) an outer housing disengagably operably connected to and synchronized with said first and second conveying means and the work piece treating means, and adapted to be driven by said first drive means, and

(2) an inner housing operably connected to the upper rotary work piece-engaging member and adapted to be driven by said second drive means when said first drive means is inactivated, and

(3) means interposed between said inner and outer housings of said clutch adapted to operably connect them when said first drive means is activated, whereby both clutch housings, the work piece treating means, and the first and second means for conveying the work pieces are then driven in unison by said first drive means.

4,411,218

APPARATUS FOR PRODUCING STRAITED SURFACE COATINGS

Carl A. Wollam, Cortland; J. Lynn Gailey, Newton Falls, and Alexander F. Chalmers, Warren, all of Ohio, assignors to Alcan Aluminum Corporation, Cleveland, Ohio

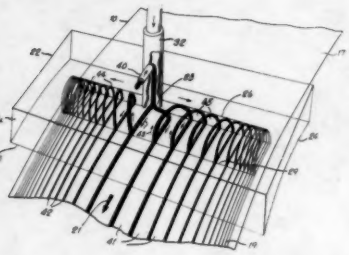
Division of Ser. No. 226,706, Jan. 21, 1981, Pat. No. 4,356,217.
This application Jun. 11, 1982, Ser. No. 387,492
Int. Cl.³ B05C *5/02*
U.S. Cl. 118—411 **9 Claims**

1. Apparatus for producing a longitudinally striated coating on a major surface of an elongated strip article, comprising

(a) structure defining an elongated trench for containing liquid coating material, said trench having an open long side of length equal to a predetermined desired width of

coating to be applied to a strip article major surface, said trench being otherwise enclosed and further having at least one aperture, in a long side of the trench and spaced from said open side and shorter than the entire length of the trench, for admitting flowing liquid coating material to the trench;

(b) means for continuously advancing a strip article longitudinally past said trench open side in a direction transverse to the long dimension of the trench open side while maintaining a major surface of the article in facing proximate relation to the trench open side so as to constitute a moving wall closing said open side; and



(c) means for delivering under pressure to the trench, through each said aperture, concurrent laminar flows of at least two liquid coating materials, for maintaining the trench entirely filled with the liquid coating materials and applying to the article major surface at said open side a coating layer thereof comprising alternating longitudinal striations of the two coating materials resulting from distribution of the two coating materials within the trench caused by movement of the article major surface at said open side.

4,411,219

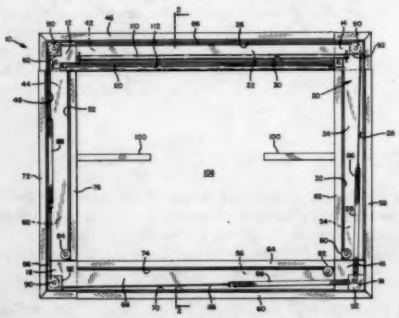
APPARATUS FOR PROTECTING THE FRAME SURROUNDING A WINDOW OR DOOR OPENING AND A WINDOW OR DOOR WITHIN THE OPENING

Jack L. Keith, Oregon City, Oreg., and Thomas E. Gies, 3227 SW. 25th, Gresham, Oreg. 97030, assignors to Thomas E. Gies, Gresham, Oreg.

Filed Feb. 22, 1982, Ser. No. 351,188

Int. Cl.³ B05C *21/00*

U.S. Cl. 118—505 **16 Claims**



1. An apparatus for protecting the frame surrounding a window or door opening and a window or door within the opening comprising:

a rectangular framework comprising plural frame members which are slidably interconnected so as to permit the framework to expand and contract in two dimensions;

biasing means mounted to said framework for contracting the framework; and

said framework including engagement means for engaging the periphery of the window or door frame to clamp the framework to such frame and cover the frame upon contraction of the framework.

4,411,220

MASS PRODUCTION UNIT FOR PRODUCING EGGS OF AN INSECT

Jean D. Voegele; Pierre E. J. Jourdheuil, both of Antibes, and Jeanne Daumal, Juan-les-Pins, all of France, assignors to Inst. Nat. de la Recherche Agronomique, France

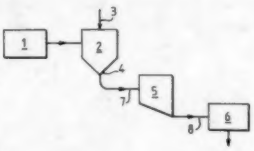
PCT No. PCT/FR80/00113, § 371 Date Mar. 6, 1981, § 102(e) Date Mar. 6, 1981, PCT Pub. No. WO81/00185, PCT Pub. Date Feb. 5, 1981

PCT Filed Jul. 7, 1980, Ser. No. 243,961

Claims priority, application France, Jul. 10, 1979, 79 17904

Int. Cl.³ A01K *67/00*

U.S. Cl. 119—1 **7 Claims**



1. Mass-production unit for the eggs of an insect, notably of the meal-moth genus, comprising:

an incubator for eggs of said insect, including a ventilated enclosure comprising movable supports for stacks of alveolar elements horizontally, said alveolar elements each containing one egg and a dosed amount of feeding semolia;

a hatcher for receiving eggs at the pre-nymph stage from said incubator and containing movable supports for the stacking of said alveolar elements in parallel and edge-wise in line with an outlet hopper, and provided with a carbon dioxide inlet for the narcosis of imagos emerging from said pre-nymph stage; and

a laying place wherein said imagos provide for the production of eggs, including an arrangement of parallel sheets arranged edge-wise in line with an outlet hopper to a collector member for said eggs;

said hatcher, laying place and collector being connected successively by a pneumatic transport duct, said incubator, hatcher and laying place being provided with means for regulating temperature and, if necessary, ventilation

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4,411,221

TURNING OF EGGS IN INCUBATORS

Francis H. Pearce, West Brinsea, Congresbury, Avon BS19 5JR, England

Filed Feb. 1, 1982, Ser. No. 344,869

Claims priority, application United Kingdom, Feb. 25, 1981, 8105871

Int. Cl.³ A01K *41/06*

U.S. Cl. 119—44 **11 Claims**

1. In an incubator which comprises:

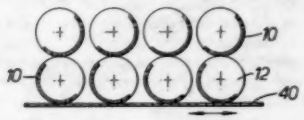
a housing for accomodating eggs to be hatched;

a member within the housing and capable of moving with respect to the housing;

motive means for intermittently causing relative movement between the member and the housing; and

a first layer of elongate channel-defining elements each

having a longitudinally extending axis and capable of contacting the member in a manner such that, upon intermittent movement of the member, each element is caused to undergo corresponding intermittent rotational movement about its own longitudinal extending axis thereby causing rotation of any eggs located within the element;



the improvement which comprises the provision of a further layer of elongate channel-defining elements accomodated above, and in contact with, the elements of the first layer in a manner such that rotation of the elements in the first layer causes rotation of the elements in the further layer.

4,411,222

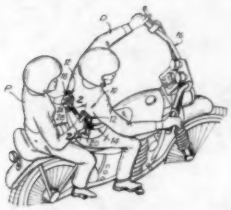
SAFETY APPARATUS FOR PASSENGERS ON VEHICLES

Morton M. Wolfson, 70-34 Olcott St., Forest Hills, N.Y. 11375

Filed Feb. 19, 1982, Ser. No. 350,293

Int. Cl.³ A01K *29/00*; A41F *19/00*

U.S. Cl. 119—96 **4 Claims**



1. Safety belt apparatus for passengers on vehicles, such as motorcycles and the like, said apparatus comprising:

a belt adapted to encircle the waist region of a vehicle operator;

a pair of grip devices attached to said belt, each grip device including a substantially U-shaped handle portion having a pair of free ends and a substantially planar plate member to which said free ends of said U-shaped handle portion are fixed so that said handle portion and plate together define a closed loop, said plate member being situated in a plane which is substantially normal to a plane in which said U-shaped handle portion is situated, and wherein a pair of spaced, parallel slots are formed through said plate member, said slots being substantially parallel to the plane in which said handle portion is situated; and

wherein said belt extends through said pair of slots of each of said grip devices so that said grip devices are attached to said belt and are adjustably positionable thereon.

4,411,223

METHOD OF OPERATING AN I.C. ENGINE

Martin Kiely, Airglooney, Tuam, Co. Galway, Ireland

Filed Jun. 19, 1981, Ser. No. 275,512

Claims priority, application Ireland, Jun. 20, 1980, 1292/80; May 14, 1981, 1079/81

Int. Cl.³ F02B *43/08*, *75/12*

U.S. Cl. 123—3 **12 Claims**

1. Fuel supply apparatus for an internal combustion engine comprising:

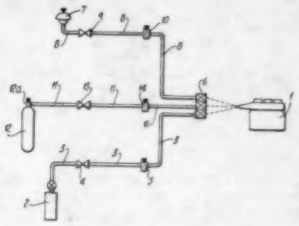
(a) means for generating hydrogen gas comprising

(i) a reactor vessel adapted to accommodate a quantity of an alkali metal or an alkaline earth metal, and

(ii) means for supplying water to said metal to generate hydrogen gas by the reaction of said metal with water, said water supplying means being responsive to changes in gas pressure in said reactor vessel;

(b) a hydrogen dust for communicating between the reactor vessel and the intake of an internal combustion engine;

(c) an air duct for communicating between the atmosphere and the engine intake and/or an oxygen duct for communicating between an oxygen source and the engine intake;



(d) a vacuum-operated non-return valve for admitting hydrogen from the reactor vessel through the hydrogen duct when the pressure at the engine intake is less than the gas pressure in said reactor vessel; and

(e) valve means in each of said ducts, each of which is adapted for controlling at least in part the flow of gas through the respective duct, and is interlinked with the other or others of said valve means, so that flow of hydrogen gas through the hydrogen duct is controllable in proportion to the flow of air through the air duct and/or the flow of oxygen through the oxygen duct.

4,411,224

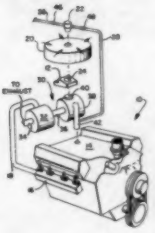
FLUID INJECTION SYSTEM FOR A TURBOCHARGED INTERNAL COMBUSTION ENGINE

Toronta P. Goodman, Summit Point, W. Va., assignor to The Goodman System Company, Inc., New York, N.Y.

Filed Sep. 24, 1981, Ser. No. 305,263

Int. Cl.³ F02D *19/00*; F02M *25/04*

U.S. Cl. 123—25 A **11 Claims**

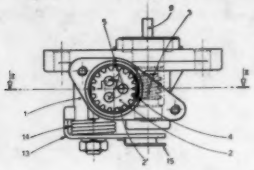


1. A system for injecting fluid into an internal combustion engine, said system comprising means for supplying an air/fuel mixture to said engine, means driven by the exhaust gases of said engine for receiving said mixture and pressurizing said mixture in proportion to the load on said engine, and flow passage means connected to a source of said fluid and to said pressurizing means for receiving said fluid and said mixture, said flow passage means being formed and arranged to draw said fluid from said source in response to the flow of said mixture and inject it into said supplying means at a rate proportional to the pressure of said mixture.

4,411,225
OIL PUMP FOR INTERNAL COMBUSTION ENGINES

Pierluigi Dell'Orto, Milan, Italy, assignor to Dell'Orto S.p.A., Milan, Italy

Filed Apr. 2, 1982, Ser. No. 364,648
Claims priority, application Italy, Apr. 7, 1981, 20966 A/81
Int. Cl.³ F01M 3/02, 1/00
U.S. Cl. 123—73 AD 5 Claims

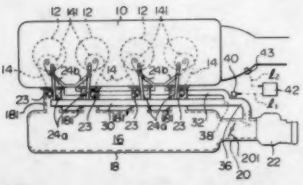


1. An oil pump for two-stroke internal combustion engines, intended to feed such engines from separate fuel and oil tanks, of the type comprising a distributing body, which is caused to rotate by a worm-and-wheel mechanism and which houses one or more cylinders positioned parallel to the axis of the body itself at a short distance therefrom, within each of which cylinders a cam-controlled piston can be displaced against the action of return-spring means, characterized in that the said distributing body coincides with the wheel of the worm-and-wheel mechanism and does not have a true and proper rotation axle, in that the said cylinders are fed and discharged at their ends facing the front surface of the distributing body, and in that the cam controlling the pistons of said cylinders is in the form of an inclined plane, the inclination of which can be varied under the control of means acting in response to the opening of the carburettor throttle valve of the engine to which the pump is applied.

4,411,226
INTAKE SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Takeshi Okumura, 122-1 Momozono; Kiyoshi Nakanishi, 1321, Mishuku, both of Susono-shi, Shizuoka-ken, and Tokuta Inoue, 257-10, Senmaibara, Icchoda, Mishima-shi, Shizuoka-ken, all of Japan

Filed Aug. 14, 1981, Ser. No. 292,886
Claims priority, application Japan, Oct. 17, 1980, 55-144439
Int. Cl.³ F01L 3/06
U.S. Cl. 123—188 M 4 Claims



1. An intake system for an internal combustion engine, comprising:

a main intake passageway having helical shaped ends opened to respective combustion chambers of the engine, each of the helical shaped ends comprising an inlet portion of a straight tube shape for receipt of flow and an outlet portion of a helical shape for discharge of flow;

a first sub-intake passageway having ends, at least one end of which is connected to the outlet portion of the respective helical shaped end so that the flow of fluid from the first sub-intake passageway assists to increase the intake efficiency of the flow of fluid introduced from the main passageway to the respective combustion chambers;

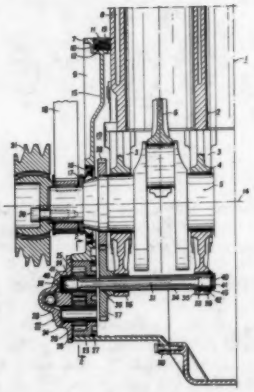
a second sub-intake passageway having ends, each of which is connected to the inlet portion of the respective helical shaped end so that the flow of fluid from the second sub-intake passageway assists to increase the effect of a swirl introduced from the main passageway to the respective combustion chamber; and

change-over means responsive to operating conditions of the engine for selectively introducing fluid into the first sub-intake passageway or the second sub-intake passageway.

4,411,227
INTERNAL COMBUSTION ENGINE

Gerhard Feichtinger, Graz, Austria, assignor to Hans List, Graz, Austria

Filed Nov. 13, 1981, Ser. No. 321,047
Claims priority, application Austria, Nov. 27, 1980, 5811/80
Int. Cl.³ F01M 1/00
U.S. Cl. 123—196 R 2 Claims

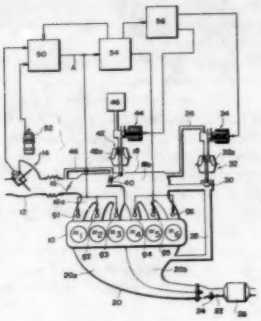


1. An internal combustion engine comprising, a crankcase, an engine unit support elastically mounted in said crankcase, said engine unit support including a cylinder head, a cylinder, a piston, a connecting rod, crankshaft main bearings and a crankshaft, an oil pump mounted on a front wall of said crankcase, means for driving said pump by said crankshaft, said pump including a driven pump gear, a hollow cylindrical bearing bushing supporting said driven gear, said driving means comprising a rotatable flexible shaft having one end extending into said bushing which is connected adjacent an outer end thereof to said one end for rotation with said shaft, bearing brackets extending from said crankshaft main bearings, said driving means further comprising a hollow cylindrical sleeve rotatably mounted on at least a first pair of said brackets lying adjacent said pump, said flexible shaft extending into said sleeve, the other end of said shaft being connected to an inner end of said sleeve for rotation therewith, and said shaft being axially displaceable within said bushing and said sleeve at said connected ends thereof.

4,411,228
SPLIT TYPE INTERNAL COMBUSTION ENGINE

Fukashi Sugasawa, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Kanagawa, Japan

Filed Nov. 24, 1980, Ser. No. 209,969
Claims priority, application Japan, Nov. 27, 1979, 54-153440
Int. Cl.³ F02D 17/00
U.S. Cl. 123—198 F 6 Claims

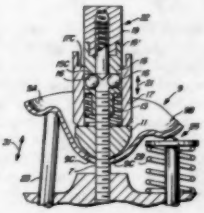


1. An internal combustion engine comprising:
(a) first and second cylinder units each including at least one cylinder;
(b) an intake manifold having therein a throttle valve, said intake manifold being divided downstream of said throttle valve into first and second intake passages respectively communicating with said first and second cylinder units, said intake manifold second intake passage having therein a stop valve near its entrance;
(c) an exhaust passage;
(d) an EGR passage connected from said exhaust passage to said intake manifold second intake passage for recirculating engine exhaust gases into said intake manifold second intake passage, said EGR passage having therein an EGR valve;
(e) control means for providing a control signal and for disabling said second cylinder unit when the engine load is below a predetermined value;
(f) valve drive means responsive to the control signal from said control and disabling means for closing said stop valve and opening said EGR valve, said valve drive means adapted to prevent the simultaneous opening of both of said stop and EGR valves and including:
(1) a first vacuum source;
(2) a second vacuum souce;
(3) a pressure source whose pressure is higher than that of the first and second vacuum sources;
(4) a first valve actuator having a working chamber;
(5) a conduit for connecting said working chamber to said first vacuum source through a restriction orifice;
(6) said first valve actuator being operable to close said EGR valve when said first valve actuator working chamber is communicated with said pressure source and to open when said first valve actuator working chamber is communicated with said first vacuum source through said restriction orifice;
(7) a second valve actuator having a working chamber, said second valve actuator being operable to open said stop valve when said second valve actuator working chamber is communicated with said pressure source and to close said stop valve when said second valve actuator working chamber is communicated with said second vacuum sources;
(8) a first valve responsive to the control signal from said control and disabling means to communicate said first valve actuator working chamber with said first vacuum source through said restriction orifice, said first valve being operable to communicate said first valve actuator working chamber with said pressure source in the absence of the control signal;
(9) a second valve responsive to the control signal from said control and disabling means to communicate said second valve actuator working chamber with said second vacuum source, said second valve being operable to communicate said second valve actuator working chamber with said pressure source in the absence of the control signal;
(10) a conduit connected from said first valve actuator working chamber to said second valve actuator working chamber, said conduit having therein a check valve for permitting flow from said second valve actuator working chamber to said first valve actuator working chamber but note vice versa.

4,411,229
CYLINDER DEACTIVATION DEVICE

Nikolaus A. Curtis, Yuma, and James E. Karner, Tucson, both of Ariz., assignors to Mile-Age Research Corporation, Yuma, Ariz.

Filed Feb. 9, 1981, Ser. No. 232,877
Int. Cl.³ F02D 13/06
U.S. Cl. 123—198 F 3 Claims



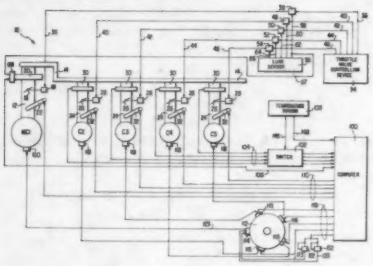
1. A cylinder deactivation device for installation in an internal combustion engine, said device comprising in combination:
(a) a rocker arm having an end portion for engaging a valve and a mid portion pivotal about a rocker ball;
(b) a stud rigidly attached in fixed relation to a cylinder head of said engine and extending through a hole in said rocker ball, said stud having a threaded upper end portion;
(c) a cylindrical stand element having a lower threaded opening tightly threaded onto said upper end portion of said stud, said stand element having a plurality of cylindrical lateral openings, and an upper opening extending from the top of said stand element to the inner end portions of said lateral openings;
(d) a sleeve element slidably disposed about said stand element and having a lower end portion engaging said rocker ball, said sleeve element also having an inner recess alignable with said lateral openings;
(e) a compression spring in said sleeve element having an upper end engaging said stand element and a lower end urging said sleeve element against said rocker ball;
(f) a plurality of balls disposed in said plurality of lateral openings, respectively;
(g) a plunger element disposed in said upper hole and movable to a lower position when said recess is aligned with said lateral openings to force said balls partially into said recess to lock said sleeve element in fixed relation to said stand element, said plunger element also being movable to an upper position which allows said balls to slide inward in said lateral holes to allow said sleeve element to slide freely over the outer surface of said stand element;
(h) a solenoid rigidly attached to the upper end portion of said stand element, said plunger element being incorporated into said solenoid
whereby said rocker ball provides a fixed pivot for said rocker

arm when said plunger is in said lower position and yields to said rocker arm when said plunger is in said upper position.

4,411,230
MASTER CYLINDER INTERNAL COMBUSTION ENGINE

John K. Lee, 11909 Gainsborough Rd., Potomac, Md. 20854

Filed Jun. 17, 1981, Ser. No. 274,392
Int. Cl.³ F02D 17/02
U.S. Cl. 123—198 F 10 Claims



1. An internal combustion engine comprising:

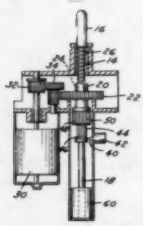
(a) a plurality of cylinders all of which are normally operating motive cylinders at least during operation of said engine subsequent to starting and during warm-up, one of said cylinders being a master cylinder having a displacement larger than any of the remaining cylinders, and

(b) means for deactivating all but the master cylinder after engine warm-up under no load and selectively activating at least one of said plurality of cylinders to provide motive power in response to increasing load imposed on said engine.

4,411,231
CARBURETOR THROTTLE VALVE ACTUATOR

Shunso F. Watanabe, Livonia; Theodore W. Daykin, Dearborn, and Elmer T. Heiney, III, Huntington Woods, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 16, 1982, Ser. No. 369,326
Int. Cl.³ F02M 3/00; F02D 31/00
U.S. Cl. 123—339 9 Claims



1. A motor vehicle throttle valve actuator comprising a longitudinally movable actuator having a first range of movement for actuating a vehicle throttle valve in a speed control mode and having a second range of movement for actuating the vehicle throttle valve in an engine idle speed control mode;

a drive means coupled to said actuator for effecting the longitudinal movement of said actuator in said ranges;

clutching means engageable with said actuator for rendering the actuator operable in said ranges;

the actuator comprising an elongated screw means coupled to the drive means;

the clutching means being engageable with said screw means to hold the screw means against rotation while permitting a transitory longitudinal movement of the screw means between minimum and maximum throttle valve opening positions in response to drive thereof by the drive means, and spring means biasing the screw means in a throttle valve closing direction toward the second range of movement;

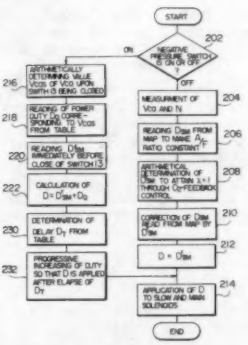
the said clutching means including a stepped diameter splined means having first and second portions of differing diameters fixed to the screw means engagable alternately by the holding means to define the ranges of movements of the screw means;

the longitudinal extent of the smaller diameter first portion of the splined means defining lower and upper limits of the speed control range of movement of the screw means and throttle valve, the longitudinal extent of the larger diameter portion of the splined means defining the upper and lower limits of the idle speed control range of movement of the screw means and throttle valve, the displacement of the holding means from the first portion spline permitting a free wheeling longitudinal movement in an axial throttle valve closing return movement of the screw means under the bias of the spring means until the holding means engages the splines of the second portion to again hold the screw means against rotation in the idle speed control range.

4,411,232
METHOD OF CONTROLLING AIR-FUEL RATIO IN INTERNAL COMBUSTION ENGINE

Takeshi Atago, and Toshio Manaka, both of Katsuta, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 30, 1981, Ser. No. 259,163
Claims priority, application Japan, May 6, 1980, 55-58682
Int. Cl.³ F02D 33/00
U.S. Cl. 123—438 3 Claims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1. In a control system for controlling an air-fuel ratio of an air-fuel mixture supplied to an internal combustion engine, the system comprising a sensor for sensing an absolute intake negative pressure of said internal combustion engine, negative pressure switch means for detecting that a difference between the atmospheric pressure and said absolute intake negative pressure has attained a predetermined value, means for detecting a revolution number of said engine, a sensor for sensing a quantity of oxygen in the exhaust gas of said engine, means for controlling a fuel supply to said engine, and a data processing unit including a central processing unit and a read-only memory for executing arithmetic operation in order to control the air-fuel ratio in dependence upon output data derived from said sensors and detecting means,

a method of controlling said control system in such a manner that the exhaust gas components are kept within a permissible range even in an accelerating operation at places of

high altitude where an oxygen content in air is decreased, the method comprising the steps of:

(a) detecting the atmospheric pressure and the corresponding altitude by said absolute intake negative pressure sensor in dependence upon said negative pressure switch means detecting, that a difference between the atmospheric pressure and said absolute intake negative pressure has attained a predetermined value;

(b) arithmetically determining a fuel supply quantity which maintaines the exhaust gas components within the permissible range at the accelerating operation at the altitude detected in the detecting step; and

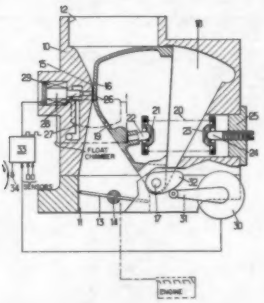
(c) applying said arithmetically determined fuel supply quantity to said fuel supply control means.

4,411,233

CARBURATION DEVICES FOR INTERNAL COMBUSTION ENGINES

Jacques Chenet, Sevres, and Michel Pierlot, Le Pecq, both of France, assignors to Societe Industrielle de Brevets et d'Etudes S.I.B.E., Neuilly-sur-Seine, France

Filed Jul. 17, 1980, Ser. No. 169,843
Int. Cl.³ F02M 7/12
U.S. Cl. 123—439 **4 Claims**



1. A carburetion device for a four cylinder internal combustion engine having intake and exhaust valves, of the type wherein a couple of cylinders inherently receive a fuel/air mixture leaner than the other couple, said device comprising:

an intake passage,

an operator operated main throttle in said passage,

an auxiliary throttle located in said passage upstream of said main throttle and which opens automatically and progressively as the air flow through said passage increases,

a fuel flow circuit extending from a float chamber to a discharge orifice, opening into the intake passage substantially at the throat of a venturi formed by a constricted part of the passage and by said auxiliary throttle member,

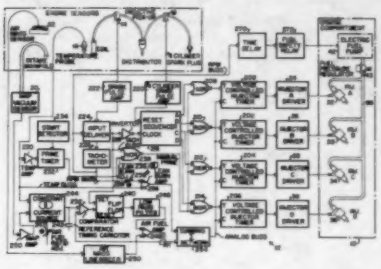
and fuel/air mixture control means having a solenoid valve located on said fuel flow circuit, electrical means operatively associated with the auxiliary throttle for providing a signal depending on the position of said auxiliary throttle and electronic circuit means connected to receive said signal and constructed to provide one actuating pulse to said solenoid valve per revolution of the engine at times selected for the solenoid valve to open before opening of an intake valve of a cylinder inherently receiving a leaner fuel mixture and to meter the duty ratio of said pulses responsive to said signal.

4,411,234

FUEL SYSTEM FOR INTERNAL COMBUSTION ENGINE

Harold G. Middleton, Seattle, Wash., assignor to Advanced Fuel Systems, Seattle, Wash.

Filed Nov. 17, 1980, Ser. No. 207,693
Int. Cl.³ F02D 5/02
U.S. Cl. 123—485 **14 Claims**



1. A fuel system for an internal combustion engine, comprising:

a cylindrical conduit receiving induction air through an inlet and having an outlet connected to an intake manifold for said engine;

a butterfly valve mounted in said conduit operatively connected to a throttle for controlling the flow of induction air through said conduit;

a plurality of transducer means for measuring engine operating conditions of temperature, rotational velocity and induction air mass flow of said internal combustion engine, and generating corresponding indicating signals;

control means receiving said indicating signals and generating an injector control signal corresponding to the quantity of fuel to be mixed with said induction air, said injector control signal being a periodically generated pulse having a duration determined by the magnitude of a fuel quantity signal, said fuel quantity signal being generated by a calculator circuit including timer means having a charging input which floats when said timer means is set and is held at a predetermined voltage when said timer means is reset, a timing capacitor connected between the charging input of said timer means and a fixed voltage, trigger means for periodically setting said timer means at a rate which is proportional to the measured rotational velocity of said engine, charging means connected to said timing capacitor for applying a charging current to said timing capacitor which is inversely proportional to the measured temperature of said engine, integrator means for generating as said fuel quantity signal an output signal having a magnitude indicative of the integral with respect to time of the difference between the measured induction air mass flow and the voltage across said timing capacitor, and comparator means connected to said timer means and said integrator means for resetting said timer means responsive to the voltage across said timing capacitor reaching a predetermined percentage of said fuel quantity signal, whereby the magnitude of said fuel quantity signal is automatically adjusted to maintain the duty cycle of said timer means at a value determined by the measured induction air mass flow by varying said fuel quantity signal in inverse proportion to the measured temperature and rotational velocity of said internal combustion engine and in direct proportion to the measured induction air mass flow of said internal combustion engine; and

a fuel injector mounted in said conduit receiving pressurized fuel and injecting said fuel into said conduit in response to said injector control signal, said fuel undergoing a pressure drop upon injection sufficient to produce flash vapor-

ization of at least a major part of said fuel, thereby promoting complete combustion of said fuel.

4,411,235

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINE

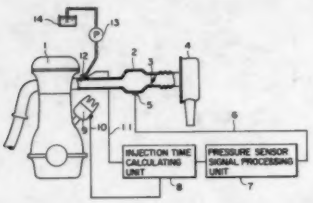
Kazuo Shinoda; Nobuyuki Kobayashi, both of Toyota, and Toshiaki Isobe, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Jan. 7, 1982, Ser. No. 337,716

Claims priority, application Japan, Jul. 24, 1981, 56-115272

Int. Cl.³ G01F *1/68;* F02D *5/00*

U.S. Cl. 123—488 **16 Claims**



1. A fuel injection system for internal combustion engines having an amount of fuel injection controlled in relation to pressure measured in an intake pipe, characterized in that a pressure sensor signal processing unit connected between a pressure sensor for measuring the pressure in the intake pipe and a calculating unit for calculating fuel injection time comprises a first low pass filter, a second low pass filter connected in series to said first low pass filer, a subtraction circuit connected to the output terminal of the first low pass filter and the output terminal of the second low pass filter and an addition circuit connected to the output terminal of said subtraction circuit and the output terminal of the first low pass filter.

4,411,236

AIR-FUEL RATIO CONTROL SYSTEM

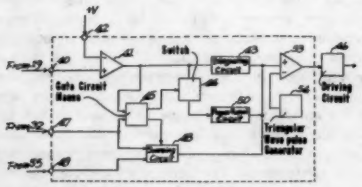
Fujio Matsui, Musashino, and Hitoshi Suzuki, Niiza, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo and Nissan Motor Co., Ltd., Yokohama, both of, Japan

Filed Dec. 9, 1980, Ser. No. 214,604

Claims priority, application Japan, Dec. 13, 1979, 54-162073

Int. Cl.³ F02B *3/00;* F02M *17/00*

U.S. Cl. 123—492 **11 Claims**



1. In a system for controlling an air-fuel ratio for an internal combustion engine having an induction passage, an exhaust passage, a throttle valve, first detecting means for detecting a concentration of a constituent of exhaust gases passing through said exhaust passage, means for supplying air-fuel mixture to the induction passage, electromagnetic valve means for correcting the air-fuel ratio of the air-fuel mixture supplied by said air-fuel mixture supply means, comparator means for comparing the output signal of said first detecting means with a reference value, integrating circuit means including a proportional circuit for integrating the output of said comparator means, driving circuit means for driving said electromagnetic valve means in dependency upon the output signal of said integrating circuit means, the improvement of the system comprising:

second detecting means for detecting the operation of said engine;

a first switch means for decreasing the control operation of the system;

gate circuit means responsive to the outputs of said comparator means and said second detecting means for actuating said first switch means;

said gate circuit means comprising logic gate means responsive to the output of said comparator means when lean air-fuel mixture is supplied and to the output of said second detecting means at the acceleration of the engine for actuating said first switching means.

4,411,237

DRIVE MECHANISM FOR FUEL INJECTION PUMPS OF AN INTERNAL COMBUSTION ENGINE

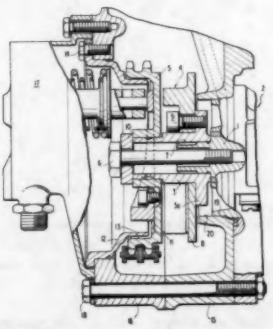
Erich Ableitner, Remseck; Ulrich Conrad, Ludwigsburg; Hans-Otto Derndinger, and Gerd Niemeier, both of Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Sep. 26, 1980, Ser. No. 191,298

Claims priority, application Fed. Rep. of Germany, Sep. 27, 1979, 2939063

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—501 **7 Claims**



1. A drive mechanism for a fuel injection pump of an internal combustion engine, the drive mechanism including a drive shaft adapted to be connected to a camshaft of the fuel injection pump, a drive sprocket means provided on the drive shaft, and an injection timer means arranged on the drive shaft, characterized in that

the drive shaft is formed as a socket sleeve member and is floatingly supported on the camshaft,

means are provided for centering the drive sprocket means relative to the injection timing means,

the drive sprocket means includes an annular recess engageable with the centering means,

the drive sprocket means and injection timer means are disposed in a crankcase,

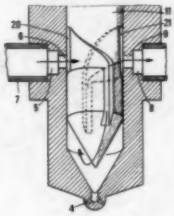
a timing case cover means is provided for covering the crankcase, and

the centering means is a centering ring attached to one of the timing case cover means and an end wall of the crankcase.

4,411,238
PUMP-INJECTOR DEVICE FOR AN INTERNAL COMBUSTION ENGINE

Andre Ecomard, Marly le Roi, and Louis Briand, Sevres, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Jul. 24, 1981, Ser. No. 286,324
Claims priority, application France, Jul. 25, 1980, 80 16551
Int. Cl.³ B05B 9/00
U.S. Cl. 123—501 6 Claims



1. A pump injector device for internal combustion engine, comprising a body provided with a bore whose bottom communicates with at least one fuel injection orifice or nozzle, at least one fuel inlet duct opening in the bore through an inlet port, said duct being connected with a source of pressurized fuel, a piston or plunger slidably mounted in said bore between a first end positio where said piston obturates said injection nozzle and a second end position where said piston is spaced from said bottom of said bore, and fuel metering means for injecting a determined fuel quantity, said fuel metering means comprising:

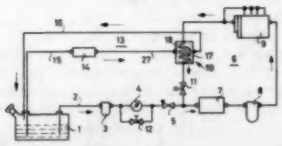
(a) at least one feed groove provided in the piston wall and opening at the end thereof located closest to the injection orifice, this groove periodically communicating with said fuel inlet port during the displacement of the piston and forming at least one edge inclined to the piston axis and whose position relative to said inlet port controls the fuel injection, and

(b) means for adjusting the angular distance separating said inlet port and said inclined edge of said groove.

4,411,239
FUEL COOLING SYSTEM FOR USE WITH A CLOSED FUEL INJECTION CIRCUIT IN A DIESEL ENGINE

Heinz Kelch, Königsfeld, Fed. Rep. of Germany, assignor to Kienzle Apparate GmbH, Fed. Rep. of Germany

Filed Feb. 16, 1982, Ser. No. 349,270
Claims priority, application Fed. Rep. of Germany, Feb. 26, 1981, 3107141
Int. Cl.³ F02M 31/00
U.S. Cl. 123—557 8 Claims

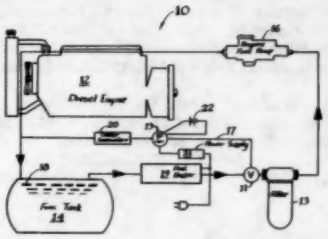


1. A cooling system for the fuel used in a diesel engine comprises a fuel tank, a suction pipe connected at one end to said fuel tank, a closed fuel injection circuit connected to the other end of said suction pipe for receiving fuel from said fuel tank, a fuel cooling circuit having an inlet end and an outlet end each opening into said fuel tank, a fuel pump for circulating fuel through said fuel cooling circuit, a heat exchanger connected to said fuel cooling circuit and to said closed fuel injection circuit for circulating the fuel flowing in said closed circuit in indirect heat transfer relation with the fuel circulating in said fuel cooling circuit.

4,411,240
METHOD AND APPARATUS FOR THE PREVENTION OF LOW TEMPERATURE DIESEL ENGINE FAILURE

John J. Kravetz, 87 Ox Bow Rd., Fairfield, Conn. 06430

Filed May 5, 1982, Ser. No. 374,965
Int. Cl.³ F02N 17/02; F02M 31/00
U.S. Cl. 123—557 16 Claims

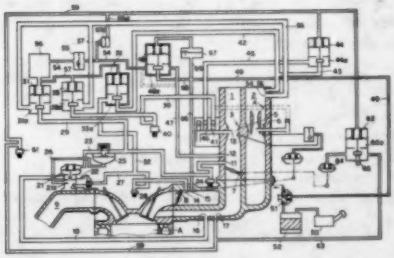


1. A method for preventing waxing and sudden failure in a diesel engine which comprises part of a diesel fuel circulatory system, with said circulatory system further including a fuel storage tank, said method comprising the steps of diverting diesel fuel flow from said engine and associated fuel pump only during non-operation of the engine and thereafter circulating said diesel fuel during said non-operation in an auxiliary closed fuel line loop integral with said diesel fuel circulatory system but which loop does not include said engine and associated fuel pump with said fuel storage tank being included within said auxiliary fuel line loop.

4,411,241
METHOD OF CONTROLLING EGR FOR INTERNAL COMBUSTION ENGINES

Tokuzi Ishida, Hamamatsu, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Mar. 23, 1982, Ser. No. 361,055
Claims priority, application Japan, Jun. 15, 1981, 56-90907
Int. Cl.³ F02M 25/06; F02P 5/00; F02M 33/02
U.S. Cl. 123—568 4 Claims



1. A method of controlling exhaust-gas recirculation for an internal combustion engine having a primary intake passage for supplying an air-fuel mixture under a full range of loads, a secondary intake passage for supplying an air-fuel mixture under high loads, and an exhaust-gas recirculation passage

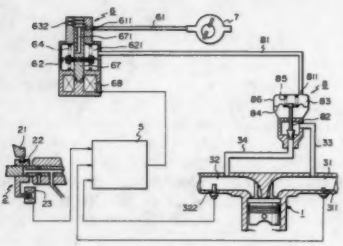
having an exhaust-gas recirculation valve for introducing an exhaust gas into said primary intake passage, said method comprising the step of utilizing a vacuum at a primary throttle valve in said primary intake passage and a vacuum at a secondary throttle valve in said secondary intake passage to control said exhaust-gas recirculation valve.

4,411,242

METHOD AND APPARATUS FOR CONTROLLING EGR IN INTERNAL COMBUSTION ENGINE

Toshihiko Igashira, Toyokawa; Takeshi Tanaka, Toyohashi; Kiyonori Sekiguchi, Aichi, and Hiromichi Yanagihara, Gotenba, all of Japan, assignors to Nippon Soken, Inc., Nishio and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Apr. 1, 1982, Ser. No. 364,456
Claims priority, application Japan, Apr. 3, 1981, 56-49291; Jun. 9, 1981, 56-95522; Feb. 16, 1982, 57-23465
Int. Cl.³ F02M 25/06
U.S. Cl. 123—569 8 Claims



4. An apparatus for controlling the EGR in an internal combustion engine, comprising an EGR valve having a diaphragm chamber, a path for supplying pressure to said diaphragm chamber, a constant pressure valve for maintaining the pressure supplied to said diaphragm chamber at a selected value, means for detecting the fuel amount, a cam driven by the axis of the fuel regulating lever of a fuel injection pump, a cam follower actuated by said cam, and a first and a second spring inserted between said cam follower and the valve shaft of said constant pressure valve, the preset loading of said first spring being determined by the preset loading of said second spring, wherein the profile of said cam is determined by the following equation:

$$W=-l_3\theta^2+m_3\theta-n_3$$

where

W is the preset loading in kg;

θ is the phase of the cam in degrees;

n_3 is a constant; and

l_3 and m_3 are constants having the following relationship:

$$l_3/m_3=(R_0/4G)-a_3$$

where

R_0 is a constant between 14 and 15 as the stoichiometrical air-fuel ratio of the fuel,

G is the intake gas amount per revolution of the engine under typical running conditions in g/rev, and

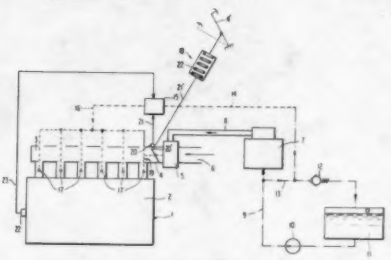
a_3 is a constant between 2.5 and 3.6.

4,411,243

EXTERNALLY OPERATED INTERNAL COMBUSTION ENGINE

Horst Hardenberg, Stuttgart, and Horst Bergmann, Esslingen, both of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Feb. 25, 1981, Ser. No. 237,901
Claims priority, application Fed. Rep. of Germany, Feb. 29, 1980, 3007664
Int. Cl.³ F02B 7/02
U.S. Cl. 123—577 7 Claims



1. A multicylinder internal combustion engine having at least a spark plug operable by a homogeneous fuel mixture, the engine comprising a heated evaporator means for completely vaporizing a liquid fuel, means connected with the evaporator means for producing an air/fuel mixture having an approximately constant composition, throttle valve means for providing a load range dependent control of a volume of fuel supplied to the engine, wherein means are provided for connecting the throttle valve means with a load control member of the engine so that the throttle valve means is fully opened in a partial load range of the engine and remains in the fully opened position upon a further movement of the load control member, means are provided for directly injecting liquid fuel into respective cylinders of the engine, and means are at least indirectly coupled with the load control member and liquid fuel injecting means for controlling a supply of liquid fuel to the cylinders in dependence upon at least one of a load range of the engine and a rotational speed of the engine.

4,411,244

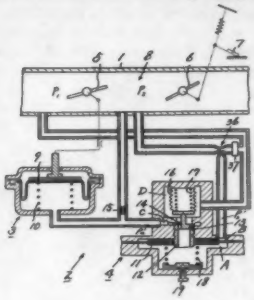
AIR FLOW MEASURING DEVICE FOR INTERNAL COMBUSTION ENGINES

Kei Kimata, Aichi; Tsugito Nakazeki, and Yoshinobu Yasuda, both of Iwata, all of Japan, assignors to NTN Toyo Bearing Co., Ltd., Osaka, Japan

Division of Ser. No. 36,493, May 7, 1979, Pat. No. 4,239,028, which is a division of Ser. No. 710,126, Jul. 30, 1976, Pat. No. 4,153,018. This application Oct. 1, 1980, Ser. No. 192,845
Claims priority, application Japan, Jul. 31, 1975, 50-93972; Sep. 2, 1975, 50-106795
Int. Cl.³ F02D 11/08
U.S. Cl. 123—389 1 Claim

1. In an internal combustion engine having a fuel control unit, an air suction pipe means, and throttle means, the improvement of an air fuel ratio compensating device for improving the performance of the engine, said compensating device comprising a flow detection valve interlocked to the fuel control unit, a flow control valve interlocked to the throttle means, an area flow meter for keeping constant the difference in the pressures existing on opposite sides of the flow detection valve and measuring the amount of inflow by the opening area of the flow detection valve, a feedback control unit comprising pressure-sensitive amplifier means for detecting and amplifying the deviation of said pressure difference by a pressure difference setting diaphragm associated therewith, and valve opening means for opening the flow detection valve by the output

from said pressure-sensitive amplifier means, and compensation means for compensating for the fluid pressure acting on opposite sides of said pressure difference setting diaphragm according to operating conditions of the internal combustion engine, wherein the compensation means includes a venturi disposed in a channel interconnecting the upstream and downstream sides of the flow detection valve and a valve opening unit located between the venturi and the upstream side of the flow detection valve for opening the venturi according to the operating conditions of the engine, with the pressure in the throat of the venturi acting on the pressure difference setting diaphragm.

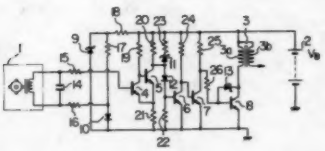


4,411,245

INTERNAL COMBUSTION ENGINE CONTACTLESS IGNITION SYSTEM OF SUPPLY VOLTAGE VARIATION COMPENSATION TYPE

Toshio Tanaka, Anjo, and Katsuteru Miwa, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Sep. 22, 1981, Ser. No. 304,559
Claims priority, application Japan, Sep. 26, 1980, 55/136700
Int. Cl.³ F02P 3/04
U.S. Cl. 123—609 **8 Claims**



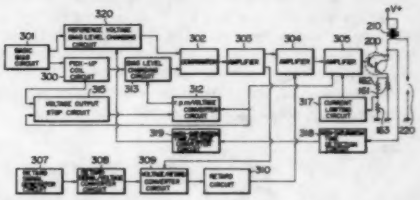
1. An internal combustion engine contactless ignition system of the supply voltage variation compensation type including:
- means for generating an alternating current signal synchronized with the rotation of an engine,
- an ignition coil for generating a high spark voltage,
- an input transistor and a power transistor which are responsive to said alternating current signal to control energization of said ignition coil,
- means responsive to variation of a voltage of a power source to shift an operating level of said input transistor,
- means for causing said operating level of said input transistor to exhibit a hysteresis characteristic,
- means for controlling said input transistor such that an operation level for switching said input transistor from its ON state to its OFF state substantially differs from that for switching said input transistor from its OFF state to its ON state, and
- further comprising an inverting transistor having a base connected to an output of said input transistor, an emitter connected to one end of said power source through a common emitter resistor and a collector connected to the other end of said power source through a collection resistor to control said power transistor.

4,411,246

IGNITION SYSTEM AND METHOD FOR INTERNAL COMBUSTION ENGINE

Noboru Sugiura, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 24, 1980, Ser. No. 200,574
Claims priority, application Japan, Oct. 26, 1979, 54-137685
Int. Cl.³ F02P 1/00
U.S. Cl. 123—644 **16 Claims**



1. An ignition system for the internal combustion engine, comprising:
- (a) means for generating an electrical signal repeated in synchronism with the rotation of the engine;
- (b) timing means for providing a retard start timing signal and a conduction start timing signal on the basis of said electrical signal;
- (c) retard means for determining a retard time in accordance with the operating conditions of said engine and providing an ignition timing signal at a time point when said retard time has passed following said retard start timing signal;
- (d) conduction duty increasing means for advancing the timing of said conduction start timing signal in a manner to increase the conduction duty of the ignition coil depending on the revolutional speed of said engine;
- (e) power output means for starting the conduction of a current for storing in said ignition coil the electromagnetic energy required for producing an ignition pulse at the time of said conduction start timing signal, said power output means substantially cutting off said current at the time of said ignition timing signal; and
- (f) ignition security means for setting an ignition time required for generating said ignition pulse in response to said substantial cut-off of said ignition coil current, said ignition time starting from said ignition timing provided by said retard means, signal and including means for preventing said conduction duty increasing means from advancing the timing of said conduction start timing signal before the lapse of said ignition time.

4,411,247

DISTRIBUTORLESS IGNITION SYSTEM FOR MULTICYLINDER INTERNAL-COMBUSTION ENGINES

Shizuo Kunita, Kawagoe; Osamu Akimoto, Niiza; Osamu Sugie, Handa; Michio Iyoda, and Kazuo Suzuki, both of Kariya, all of Japan, assignors to Sanke Electric Co., Ltd., Saitama and Nippondenso Co., Ltd., Aichi, both of, Japan

Filed Apr. 8, 1981, Ser. No. 252,251
Claims priority, application Japan, Apr. 24, 1980, 55-54692
Int. Cl.³ F02P 5/00
U.S. Cl. 123—655 **5 Claims**

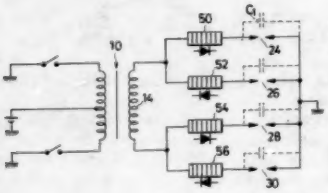
1. In an ignition system for a multicylinder, spark-ignition, internal-combustion engine, wherein an ignition coil develops voltages in its two opposite directions for causing discharges at first, second, third and fourth spark plugs in timed relation to

the revolutions of the engine, the improvement which comprises:

(a) a first high-voltage rectifier diode connected in series with the first spark plug to form a first ignition circuit which is connected at one end to one extremity of the ignition coil, the first diode being oriented to permit current flow to the first spark plug in response to the voltage developed in a first direction in the ignition coil;

(b) a second high-voltage rectifier diode connected in series with the second spark plug to form a second ignition circuit which is connected at one end to said one extremity of the ignition coil and at the other end to the other end of the first ignition circuit, the second diode being oriented to permit current flow to the second spark plug in response to the voltage developed in a second direction in the ignition coil;

(c) a third high-voltage rectifier diode connected in series with the third spark plug to form a third ignition circuit which is connected at one end to the other extremity of the ignition coil and at the other end to said other ends of the first and second ignition circuits, the third diode being



oriented to permit current flow to the third spark plug in response to the voltage developed in the second direction in the ignition coil; and

(d) a fourth high-voltage rectifier diode connected in series with the fourth spark plug to form a fourth ignition circuit which is connected at one end to said other extremity of the ignition coil and at the other end to said other ends of the first, second and third ignition circuits, the fourth diode being oriented to permit current flow to the fourth spark plug in response to the voltage developed in the first direction in the ignition coil;

(e) each diode comprising a stack of square-shaped silicon rectifier diode chips, each having a reverse breakdown voltage in the range of from about 400 to about 850 volts in order to enable the diode to withstand steep overvoltages, the reverse breakdown voltage of each diode ranging from about 27.5 to about 45.0 kilovolts, whereby each diode can function without degradation or rupture even when current flows therethrough in its reverse breakdown region, and can dampen voltages greater than the reverse breakdown voltage thereof.

4,411,248

CATAPULT CONSTRUCTION

Gilbert Kivenson, 22030 Wyandotte St., Canoga Park, Calif. 91303

Filed Nov. 27, 1981, Ser. No. 325,224
Int. Cl.³ F41B 7/00
U.S. Cl. 124—20 R **5 Claims**

1. A compact catapult for launching projectiles for target practice, plinking and the taking of small game comprised in combination of the following:

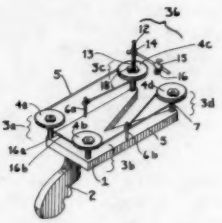
a. an elongated base having four pillars mounted to the top thereof and arranged in pairs so as to make up a front pair and a rear pair;

b. two anchoring posts also mounted to the top of said base so as to be positioned intermediate between the front and rear pairs of the pillars;

c. four conically grooved reels mounted by low friction bearings on said pillars so as to be freely rotatable;

d. an elastic cord fastened between said anchoring posts and stretched so as to pass around the reels and fit into the conical grooves, becoming partially tensed and having a center portion between the rear pair of reels which is perpendicular to the line of fire of the catapult;

e. a pair of closely spaced marks imprinted on the elastic cord in the middle of said center portion, the marks serving to define an accurately reproducible loading point for projectiles;



f. an aiming device with a horizontally and vertically adjustable peep sight mounted on one of the front pair of pillars;

g. a handle fixed to the bottom of said base permitting the catapult to be firmly held in one hand;

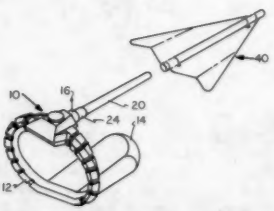
whereby a U-shaped projectile can be directly placed over said center portion of the elastic cord between said marks without the need for a projectile holder such as a pouch, the cord drawn back so as to tense it further and then released to cause a U-shaped projectile to be propelled along the line of fire.

4,411,249

TOY GLIDER WITH PNEUMATIC LAUNCHER

Bonnie R. Fogarty; A. Edward Fogarty, both of 3513 School Ave., Sarasota, Fla. 33579; Ralph Nowak, 22 Roosevelt Ave., Marblehead, Mass. 01945, and Jack S. Lovewell, 37 Central St., Peabody, Mass. 01960

Filed May 27, 1982, Ser. No. 382,695
Int. Cl.³ F41B 11/00
U.S. Cl. 124—64 **10 Claims**



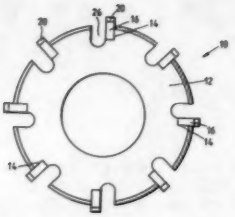
1. A toy glider and launcher therefor, comprising:

(a) a pneumatic launcher, including a closed loop flexible conduit having an integrally formed air bulb in fluid communication therewith, said air bulb being positionable for concealment in the palm of the user's hand when said flexible conduit is positioned around the user's wrist, and an open-ended launching tube for holding a projectile prior to launching, said launching tube being in fluid communication with said flexible conduit and said air bulb; and

(b) a projectile, including a flight tube having one open end and one closed end, said flight tube being moveably posi-

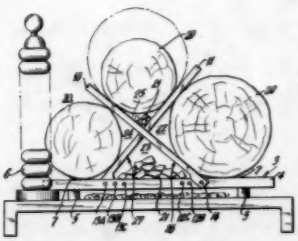
tionable on said launching tube of said pneumatic launcher, and a wing fastened to said flight tube.

4,411,250
TRUEING TOOL
Horst Lach, Dammstrasse 5, D-6450 Hanau, Fed. Rep. of Germany
Filed Apr. 22, 1981, Ser. No. 256,585
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1980, 3016740
Int. Cl.³ B24B *53/00*
U.S. Cl. 125—11 CD **2 Claims**



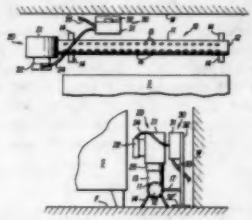
1. In a trueing tool for dressing and maintaining the shape of the working surface of a grinding wheel to maintain a predetermined profile on said working surface and remove grinding contaminants therefrom, the combination comprising a trueing roller including a shaft body, a plurality of segments on the periphery of said body, each of said segments including a breast surface and a chip chamber formed on and partially defining said segment, means integrally securing at least one profiled cutter plate on each breast surface with the cutters of succeeding segments being displaced relative to the cutter on the preceding segment to cooperatively and sequentially define a predetermined profile on the working surface of said grinding wheel and to collect in successive chip chambers the portion of said working surface removed by said cutter when said trueing tool is engaged with said working surface of said grinding wheel, each of said cutter plates including a coating of hardened material harder than the substance of the plate.

4,411,251
FIREPLACE INSERT
James Parton, 300 E. 56 St., New York, N.Y. 10022
Filed Jul. 22, 1981, Ser. No. 285,769
Int. Cl.³ F23H *13/02*
U.S. Cl. 126—165 **9 Claims**



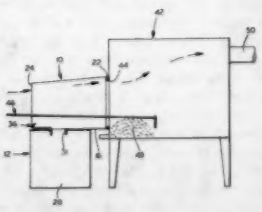
1. A metal fireplace insert comprising a frame, a plurality of arms pivotly mounted on said frame, each of said arms being pivoted for independent movement relative to each other and to the frame to form a plurality of log-receiving spaces, said frame comprises a pair of side bars and front and rear bars mounted to said side bars, said side bars being located adjacent the opposite edges of the front and rear bars, said arms being pivotly mounted on said side bars, each of said side bars having a front and rear arm pivotly mounted thereon, the front and rear arms pivotly mounted on one side bar being independently movable from the front and rear arms of the other side bar, said front and rear arms being pivoted for independent movement on opposite sides of each of said side bars.

4,411,252
WALL PROTECTOR AND HEAT CIRCULATOR
Berland M. Funkhouser, P.O. Box 2395, Winchester, Va. 22601
Filed Dec. 3, 1981, Ser. No. 327,188
Int. Cl.³ F24C *15/36*
U.S. Cl. 126—201 **5 Claims**



1. A device for placement between a free-standing heating unit and a vertical surface to prevent overheating of the vertical surface by the radiation of heat from the heating unit comprising an elongated tubular element mounted on support means and having one end closed, the other end being open; a fan assembly operatively connected with said other end of said tubular element to introduce a controlled flow of air into the interior said tube and discharged from said tube through at least two circumferentially spaced apart openings on the upper surface of said tube, one of said at least two openings being so positioned on said upper surface as to direct air passing therethrough from the interior of said tubular element in the direction of the vertical surface, the other side of said at least two openings being so positioned on said upper surface as to direct air passing therethrough from interior of said tubular element toward the adjacent heating unit surface; a temperature sensitive control assembly operatively associated with said fan assembly and activated by the temperature of the air heated by the heating unit; first electrical conduit means interconnecting said control assembly and said fan assembly and second electrical conduit means interconnecting said control assembly with a conventional source of electrical power.

4,411,253
ASH HOOD
Paul W. Devin, 31 Taine Mountain Rd., Unionville, Conn. 06085
Filed Nov. 5, 1982, Ser. No. 439,648
Int. Cl.³ F23J *1/00*
U.S. Cl. 126—242 **7 Claims**



1. A substantially portable device for use in removing ash

from a stove or the like without need for any attachment thereto, the stove having an ash-removal opening through which a draft of air flows during normal operation, said device comprising:

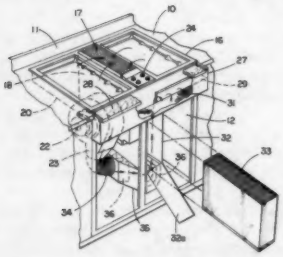
a duct having an open front end dimensioned and configured to substantially enclose the ash-removal opening of the stove for direct, close-fitting positioning thereagainst, and an open back end for free air flow and ash removal access, the bottom wall portion of said duct having an opening therethrough intermediate said front and back ends and entirely within the confines of said duct, said device also including a displaceable door for covering said bottom wall portion opening, and means for securing said duct to an ash receptacle disposed therebeneath to permit free-standing positioning of said device in front of the stove, said duct providing an extension from the stove opening when aligned generally horizontally therewith and positioned thereagainst, whereby ash can be withdrawn from the stove and guided to said opening, through which it can fall into the underlying receptacle, and whereby the draft of the stove will cause air to flow into said back end and to sweep across said opening, to prevent the escape of any substantial amount of airborne ash fines or dust.

4,411,254

COUNTERTOP RANGE WITH PROXIMITY VENTILATION AND ELECTRONIC AIR CLEANER

Thomas R. Field, Noblesville, and Donald J. Simon, Indianapolis, both of Ind., assignors to The Jenn-Air Corporation, Indianapolis, Ind.

Filed Apr. 24, 1981, Ser. No. 257,497
Int. Cl.³ F24C *15/20*
U.S. Cl. 126—300 **5 Claims**



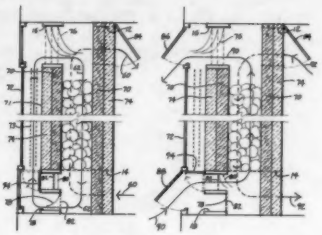
1. In a cooking range assembly for installation in a conventional stack-on kitchen cabinet having a countertop and underlying cabinet doors, said assembly being of the type having a drop-in range component with surface heating units and a proximity ventilating air intake on its top surface and including an enclosure forming a ventilating air plenum chamber and mounting a motor-driven fan having a discharge fitting and further including a first air filtering member housed in said enclosure spaced from said air intake and upstream from said fan, said chamber and fan depending beneath said top surface, said drop-in range component being accommodated in a cut-out portion of the cabinet countertop, the improvement comprising a housing downstream from said fan discharge fitting and including a second air filtering member in the form of an electrostatic air filtering unit, said housing being mounted closely adjacent said plenum chamber within the cabinet, a conduit connecting said fan discharge fitting and the interior of said filtering unit housing, and a discharge passage for said housing terminating at a discharge means including an extension chamber overhanging said cabinet doors and further including an aperture at the front of the cabinet and beneath the countertop for discharging filtered air generally downwardly along the exterior face of said cabinet doors into the kitchen environs.

4,411,255

PASSIVE THERMAL STORAGE WALL STRUCTURES FOR HEATING AND COOLING BUILDINGS

Kenneth S. Lee, 2046 Mershon, Ann Arbor, Mich. 48104

Filed Jan. 6, 1981, Ser. No. 222,896
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—429 **22 Claims**



1. A building wall for thermal storage and passive air siphon heat exchange comprising a plurality of hollow vertical parallel columns formed inside a wall of sufficient mass for significant thermal storage,

vent means at the top and bottom of a first column, said vent means of the first column communicating with the interior of a building,

vent means at the top and bottom of a second column adjacent the first column, said vent means of the second column adapted to communicate with an external solar air collector,

said wall providing heat exchange between the air in the adjacent columns when the air is moving in both columns, said movement of the air in one column caused primarily by the exchange of heat with the other column of moving air, and said wall providing thermal storage or thermal release when air is moving in only one of the adjacent columns, and

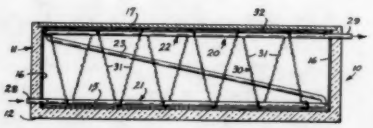
a bi-directional valve in the upper vent and a uni-directional valve in the lower vent of the column in communication with the external air collector.

4,411,256

SOLAR COLLECTOR

Philip J. Fleming, Rte. 3, Box 162, Quincy, Fla. 32351

Filed Mar. 16, 1982, Ser. No. 358,563
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—441 **7 Claims**



7. A solar collector comprising a housing having a bottom wall, side and end walls, said side and end walls defining a window opening, said walls having substantial insulation, the inner faces of said side and end walls being highly reflective, said bottom wall having an inner nonreflecting heat absorbing surface, said side walls having substantial height but less than the width of said bottom wall, liquid piping means disposed within said container, said piping means including series connected spaced lengths of pipes at upper and lower levels within the housing, said lengths being so positioned that the solar shadows from the lengths at the upper levels during normal operation do not substantially cover the lengths at the lower levels, said pipes having nonreflecting heat absorbing surfaces,

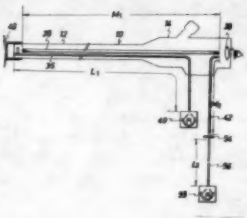
screen means engaging and extending between the lengths of the upper and lower levels forming an open baffle, said screen means having nonreflecting heat absorbing surfaces, and a transparent window covering mounted on said container and over said window opening.

4,411,257

INSPECTION ENDOSCOPE

Masashi Machida, Tokyo, Japan, assignor to Machida Endoscope Co., Ltd., Tokyo, Japan

Filed Dec. 3, 1981, Ser. No. 327,130
Claims priority, application Japan, Dec. 9, 1980, 55-175618
Int. Cl.³ A61B 1/06
U.S. Cl. 128—6 **4 Claims**



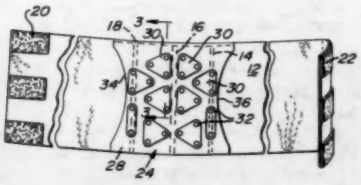
1. An inspection endoscope comprising an eyepiece, an insertion tube having an image guide and a first light guide extending therethrough with a first end of each located opposite an object to be observed, a handle portion including said eyepiece permitting visual observation of an object being observed, a first light source located opposite the second end of said first light guide to carry light to illuminate the object being observed, said eyepiece located at the second end of said image guide and an improvement comprising a data introduction guide having a first end opposite a data device and a second end located at said eyepiece, said data device comprising a display related to the observation being made, said display comprising data to be simultaneously visually compared while the object is being observed, said display comprising a color identifying sheet, said data device further comprising a second light source and a second light guide, a first end of said second light guide located opposite said second light source and a second end of said second light guide located opposite said color identifying sheet with the combination of said second light source, said second light guide and said data introduction guide presenting the same optical decay characteristics as the combination of said first light source, said first light guide and said image guide.

4,411,258

METHOD AND DEVICE FOR RELIEVING PAIN

Charles Pujals, Jr., 119 Fayette St., Bridgeton, N.J. 08302

Continuation-in-part of Ser. No. 129,154, Mar. 10, 1980, abandoned. This application Apr. 5, 1982, Ser. No. 365,459
Int. Cl.³ A61H 7/00
U.S. Cl. 128—60 **7 Claims**



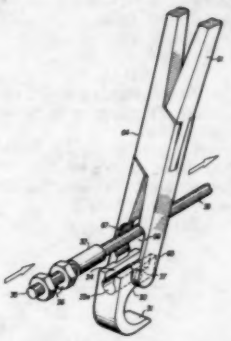
6. A peripheral modulation pad adapted to be attached to a binder for circumscribing a person's waist comprising a flexible member of non-uniform thickness so as to have thick portions and thin portions, the thicker portions having a plurality of generally pointed projections integral therewith, the thin portions being entirely free of projections, the height of the projections being uniform and the thicker portions being arranged in a pattern to provide intense stimulation to the lower back area.

4,411,259

APPARATUS FOR ENGAGING A HOOK ASSEMBLY TO A SPINAL COLUMN

Denis S. Drummond, 1214 Wellesley St., Madison, Wis. 53703

Continuation of Ser. No. 118,315, Feb. 4, 1980, abandoned. This application Nov. 24, 1981, Ser. No. 324,422
Int. Cl.³ A61F 5/00
U.S. Cl. 128—69 **6 Claims**



5. Apparatus comprising hooks, a threaded rod with sleeves and nuts and a windowed hook holder, said windowed hook holder comprising two shank members operably connected by hinge means, said hinge means providing scissor action between the shank members, said shank members each having first and second ends, the first ends of the skank members forming two opposing jaws for firmly grasping hooks, said jaws of said hook holder containing two opposing purchasing nubs for engaging mating openings in the sides of said hooks to firmly hold said hooks, the area behind the jaws consisting of an enlarged opening forming a window, said window opening cooperating with said jaws and being of sufficient size to allow passage through the opening of said threaded rod with sleeves and nuts assembled on the rod when said jaws are grasping a hook, and the second ends of the shank members opposite the jaws form substantially circular openings for holding fingers, further wherein there is disposed proximate said substantially circular openings, releasable locking means consisting of two opposing step-bar members extending inwardly from the shank members toward each other and in an overlapping relationship for releasably locking the scissor action of said shank members in a fixed position, so that an object may be firmly held in the jaws without having to maintain pressure on said substantially circular openings.

4,411,260

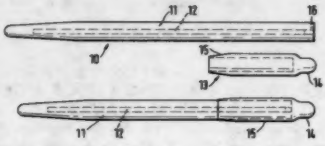
PENIS PROSTHESIS

Walter Koss, Industriestrasse, D-6222 Geisenheim, Fed. Rep. of Germany

Filed Nov. 23, 1981, Ser. No. 324,008
Claims priority, application Fed. Rep. of Germany, Nov. 24, 1980, 8031230[U]
Int. Cl.³ A61F 5/00
U.S. Cl. 128—79 **12 Claims**

1. A penis prosthesis in the form of a flexible rod member

which comprises implantable plastic material at least in the outer region, characterized in that the rod member is subdivided into at least two portions and having means for connecting said at least two portions comprising one portion having a



tubular extension portion at one end adapted to receive and overlap an end of at least one other of said at least two portions, whereby said extension portion is adapted to be pushed over said at least one other portion.

4,411,261

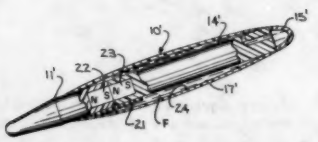
SEMI-RIGID PENILE IMPLANT

Roy P. Finney, Tampa, Fla., assignor to Medical Engineering Corporation, Racine, Wis.

Continuation-in-part of Ser. No. 150,231, May 15, 1980, Pat. No. 4,318,396, and Ser. No. 266,455, May 22, 1981. This application Dec. 9, 1981, Ser. No. 328,827

Int. Cl.³ A61F *5/00*

U.S. Cl. 128—79 **5 Claims**



1. In a penile implant comprising a relatively rigid support portion having a stem at one end for insertion into the root end of a corpus cavernosum of a penis; a separate relatively rigid, elongated tip portion with a tip at one end for insertion in the glans end of the corpus cavernosum and an intermediate portion comprising a flexible sleeve connected at one end to the support portion and at the other end to the tip portion, the improvement which comprises providing said other ends of the support portion and tip portion with attachment means which can be used to removably attach the support portion and tip portion together in the form of a unitary rod.

4,411,262

CONSTRUCTIONAL MATERIAL

Wulf von Bonin; Ulrich von Gizycki; Kuno Wagner, all of Leverkusen, and Dietmar Schüpel, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 898,753, Apr. 21, 1978, which is a continuation of Ser. No. 782,656, Mar. 30, 1977, abandoned, which is a continuation-in-part of Ser. No. 684,131, May 7, 1976, abandoned. This application Dec. 31, 1981, Ser. No. 336,206

Int. Cl.³ A61F *13/04*

U.S. Cl. 128—90 **30 Claims**

1. A flexible, workable bandaging or medical material which is stable in storage when kept under moisture-free conditions and which forms a cross-linked rigid self-supporting structure free of extensive foaming upon exposure to sufficient moisture comprising a flexible substrate impregnated or coated with a reactive one-component system consisting essentially of the free isocyanate group bearing reaction products of polyisocyanates selected from the group consisting of

phenylene-1,3-diisocyanate, phenylene-1,4-diisocyanate, mixtures of phenylene-1,3- and -1,4-diisocyanate, tolylene-2,4-diisocyanate, tolylene-2,6-diisocyanate, mixtures of tolylene-2,4- and -2,6-diisocyanate, diphenylmethane-2,4'-diisocyanate, diphenyl- methane-4,4'-diisocyanate, mixtures of diphenylmethane-2,4'- and -4,4'-diisocyanate, naphthylene-1,5-diisocyanate, triphenylmethane-4,4',4''-triisocyanate, polyphenyl-poly- methylene polyisocyanates obtained by aniline-formaldehyde condensation followed by phosgenation, with compounds which contain at least two hydrogen atoms that are reactive with isocyanates selected from the group consisting of polyesters, polyethers, polythioethers, polyacetals, polycarbonates, polyurethanes, polyureas, polyester amides, low molecular weight polyhydroxyl compounds and water.

18. A medical splinting or bandaging material comprising a flexible, workable substrate impregnated or coated with a reactive system consisting essentially of the free isocyanate group bearing reaction product of an aromatic polyisocyanate and a compound which contains at least two hydrogen atoms that are reactive with isocyanate groups, said reaction product being so formulated that:

(a) it is free of oxycarbonyl isocyanate groups;

(b) it has a viscosity below 50,000 cP at 20° C.;

(c) it contains less than about 1% by weight of volatile components which can be removed by evaporation at 12 Torr and 20° C. in one hour;

(d) said impregnated or coated flexible substrate remains stable and flexible in the absence of moisture;

(e) it will render said impregnated or coated flexible substrate into a cross-linked rigid self-supporting structure free of extensive foaming after forming into a planar or hollw configuration by reaction with water.

19. A process of forming a planar or hollow cross-linked rigid, self-supporting medical splint or bandage comprising;

(a) impregnating or coating a flexible substrate with a free isocyanate group bearing reaction product of an aromatic polyisocyanate with a compound which contains at least two free hydrogen atoms that are reactive with isocyanate groups, said reaction product being storage stable in the absence of moisture, being free pf oxycarbonyl groups; containing less than about 1% by weight of volatile components which can be removed by evaporation at 12 Torr and 20° C. in one hour; and having a viscosity below 50,000 cP at 20° C.;

(b) shaping said impregnated or coated flexible substrate to the desired configuration about the portion of the body to be supported or immobilized; and

(c) reacting said free isocyanate groups with water to yield said cross-linked rigid structure free of extensive foaming.

20. A process of forming a planar or hollow cross-linked, rigid self-supporting medical splint or bandage comprising:

(a) impregnating or coating a flexible substrate with organic compounds with molecular weights no greater than about 10,000 and containing SiOR-groups, where R is a C_1–C_{18} alkyl, a C_4–C_{14} cycloalkyl or a phanyl group, which hydrolyze upon exposure to atomspheric moisture, said compounds being storage stable in the absence of moisture;

(b) shaping said impregnated or coated flexible substrate to the desired configuration about the portion of the body to be supported or immobilized; and

(c) reacting said organic compounds with water to yield said cross-linked rigid structure.

4,411,263
INFANT EYE SHIELD

Gayle Cook, 8180 Forestdale Dr., Charlotte, N.C. 28212

Filed Sep. 23, 1981, Ser. No. 305,025
Int. Cl.³ A61F 13/00
U.S. Cl. 128—132 R 4 Claims

1. An infant eye shield, for protecting an infants' eyes from phototherapy treatment light, comprising:

an eye piece having two oval shaped protective areas which fit over the infants' eyes, a bridge area which fits over the infant's nose and interconnects said protective areas, and two temple elements oppositely connected to and radiating outwardly from said protective areas for placement over the infant's temples, wherein said temple elements are made of material with small thread-like loops thereon; and

individual adhesive tabs having, a skin side with self sticking adhesive thereon for removably adhering to the infant's skin at each temple area, and an outer side having a multiplicity of small hooks thereon, such that

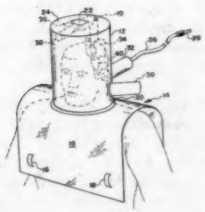
said eye piece is removably secured to the infant by engaging said loops of said temple onto said hooks when said tabs are removably attached to the infants' temples, wherein

said shield covers a minimum area of the infant's facial skin.

4,411,264
SUPPLIED AIR RESPIRATOR

Earl B. Jacobson, Crystal Lake, Ill., assignor to Nuclear Power Outfitters, Crystal Lake, Ill.

Filed Jul. 25, 1980, Ser. No. 172,425
Int. Cl.³ A62B 7/00
U.S. Cl. 128—201.23 4 Claims



1. An improved supplied air respirator adapted to be connected to a source of air, said respirator, said comprising a hood adpted to fit over the head of a user and having at least one clear portion adapted to be positioned over the eyes of the wearer which portion is capable of fogging improvement comprising:

air flow baffle means detachable from the respirator and adapted to supply air from the air source into the interior of the respirator and including means for increasing the air flow efficiency without increasing the operating noise level of said baffle means;

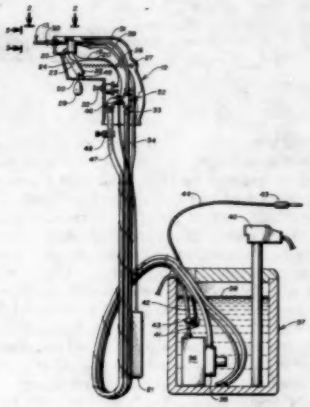
said air flow baffle means are adapted to be detachably secured on the inside surface of said respirator, said baffle means including an air flow distribution member shaped and adapted to direct air into at least one portion of said respirator; and

said air flow baffle means include a flexible tubing having a plurality of lateral openings along the circumference and length thereof and a foam layer sealingly engaged around said length covering said openings, said foam layer substantially uniformly surrounding said tubing along said length thereof and a porous material binding secured around said layer, said binding compressing said layer to eliminate any gaps in said layer and to protect said foam layer.

4,411,265
EAR WAX REMOVING DEVICE

John E. Eichenlaub, 1300 France Ave. South, Golden Valley, Minn. 55416

Continuation of Ser. No. 49,179, Jun. 18, 1979, abandoned. This application Jun. 19, 1981, Ser. No. 275,209
Int. Cl.³ A61F 7/12
U.S. Cl. 128—303.1 12 Claims



10. An ear wax removing device comprising:

(a) a mounting member;

(b) a curette having a hollow interior and rigid exterior surfaces movably mounted on said mounting member for forward and rearward longitudinal movement relative thereto and having a forward end portion and rearward end portion;

(c) said curette ha[illegible]ng fluid passages defined within the hollow interior through which a warm fluid may be circulated;

(d) a mechanism connected to said curette for controllably circulating warm fluid therethrough; and

(e) resiliently biased mounting mechanism connected to said curette and supporting and gently urging said curette forwardly.

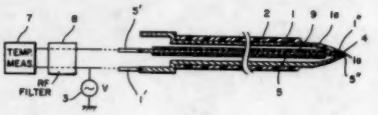
4,411,266
THERMOCOUPLE RADIO FREQUENCY LESION ELECTRODE

Eric R. Cosman, 872 Concord Ave., Belmont, Mass. 02178

Filed Sep. 24, 1980, Ser. No. 190,302
Int. Cl.³ A61B 17/39
U.S. Cl. 128—303.18 6 Claims

1. An electrode adapted for making radio frequency heat lesions in the tissue of the living body and having built-in a thermocouple sensor which can sense the temperature of the bodily tissue which is being heated, the electrode having an elongated shape with a distal end that is intended to be directed at the bodily tissue to be heated and a proximal end having connection means which is adapted to be connected to an external source of radio frequency energy and to an external

thermocouple temperature monitoring apparatus, a portion of the elongated portion of said electrode being covered with an insulating material, said electrode having an uninsulated conductive tip at its distal end from which, when in use, radio frequency current will flow to heat surrounding tissue, said electrode comprising conductive means connecting said uninsulated tip to said connection means located near said proximal end of said electrode and adapted for connection to an external source of radio frequency potential whereby when in use said uninsulated tip will be at said radio frequency potential, said electrode comprising a first metal wire element and a second metal wire element, both metal wire elements running from said proximal end to said distal end of said electrode, said two metal elements being the two sides of a thermocouple pair, said two metal elements being electrically insulated from each other over the length of said electrode except at said distal end, the distal ends of said two metal elements being electrically



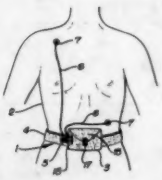
fused at said distal end of said electrode to form a thermocouple junction in such a way that a portion of each of said distal ends of said two metal elements and a portion of said fused junction are part of external surface of said uninsulated tip, the proximal ends of said two metal elements near the proximal end of said electrode are so adapted to be connected through said connection means to an external thermocouple junction potential measuring apparatus; whereby, when in use and when said electrode is inserted into the living body, then the radio frequency potential at said uninsulated tip of said electrode will cause current to flow in, and thus heat up, the tissue surrounding said uninsulated tip, and said distal portions of said two metal elements and said portion of thermocouple junction which are on the external surface of said uninsulated tip will provide intimate thermal contact with the heated tissue adjacent to said external surface, and thus, a reliable measure of the temperature of said adjacent tissue.

4,411,267

TELEMETRY TRANSMITTER HOLDER

Arnold M. Heyman, 2701 West Alameda Ave., Burbank, Calif. 91505

Filed Feb. 23, 1981, Ser. No. 237,520
Int. Cl.³ A61F 7/00; A61N 1/22
U.S. Cl. 128—385 **8 Claims**



6. A device for holding medical equipment or the like about the midsection of a person comprising:

a washable pouch fabricated from a piece of waterproof, spongy foam material having a bottom, a top, opposing sides, and opposing ends adjacent to said opposing sides and said top and bottom, with a first opening at said top and an integral securable flap joined to said pouch adjacent to said top, said flap being closable and securable over said opening;

a long, narrow, flexible, washable strip attached to said pouch at one of said opposing ends, said strip being fabricated from a piece of spongy foam material to which has been bonded on one side a fibrous cloth material having a pile surface suitable for engaging hook fibers, said strip placed for placement around the midsection of a person beneath the person's clothing with the spongy foam side of the strip against the midsection of the person;

a washable tab of material, one surface of which contains hook fibers, said tab being attached along at least one of its edges to the said opposing end of said pouch opposite to said end at which said strip is attached, said tab for engaging said pile surface when said strip is placed around the midsection of a person;

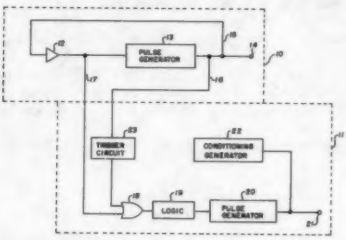
whereby medical equipment or the like may be securely held in said pouch and said pouch may be securely and comfortably attached about the mid-section of a person.

4,411,268

MUSCLE STIMULATOR

James A. Cox, Sewell, N.J., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 10, 1982, Ser. No. 347,514
Int. Cl.³ A61N 1/36
U.S. Cl. 128—421 **36 Claims**



1. A system for inducing a desired functional contraction in muscle tissue while conditioning the contracile properties of said tissue for said functional contraction which comprises:

means for generating pacing stimulation signals having parameters established by a desired functional contraction of particular muscle tissue including means applying said pacing stimulation signals to the body for initiating said desired functional contraction of said particular muscle tissue; and

means for generating a conditioning stimulation signal having parameters established by said desired functional contraction including means applying said conditioning stimulation signals to the body for conditioning the contractile properties of said particular muscle tissue.

4,411,269

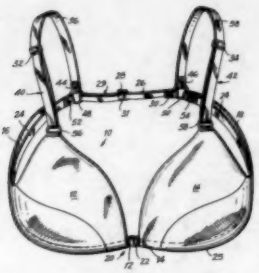
FRONT OPENING BRA WITH ADJUSTABLE BACK

Ronald Weintraub, New York, N.Y., assignor to Flexnit Company, Inc., New York, N.Y.

Filed Sep. 4, 1981, Ser. No. 299,589
Int. Cl.³ A41C 3/02, 3/00
U.S. Cl. 128—482 **11 Claims**

1. A brassiere comprising a pair of breast cups, a front-opening closure connected to said breast cups, and an adjustable back strap connecting side panels of said bust cups to one another, a pair of adjustable shoulder straps extending from the upper portions of said breast cups and terminating at the back of said brassiere in the general vicinity of the joint connection formed by said adjustable back strap and said side panels; and connection means at at least one of said joints of said adjustable back strap and said side panels with said adjustable shoulder strap comprising a triangular-like element which is coupled to said adjustable back shoulder straps and to said side panel by

means of looped sections formed on said side panel and on said adjustable back and shoulder straps; and said triangular-like element is provided with at least a pair of adjacent arms ex-



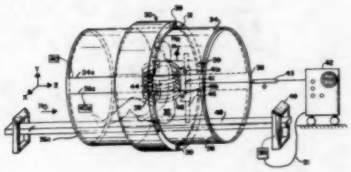
tending from one corner of said triangular-like element with protrusions at the ends of said arms for precluding said looped sections from slipping off said arms.

4,411,270

APPARATUS AND METHOD FOR NUCLEAR MAGNETIC RESONANCE SCANNING AND MAPPING

Raymond V. Damadian, 64 Shorthill Rd., Forest Hills, N.Y. 11375

Division of Ser. No. 961,858, Nov. 20, 1978, Pat. No. 4,354,499. This application Oct. 13, 1981, Ser. No. 310,782
Int. Cl.³ A61B 5/05
U.S. Cl. 128—653 **24 Claims**



1. A method of detecting selected nuclei within a specimen comprising:

(a) providing a primary static magnetic field having a known field configuration in a three dimensional space having an "X", "Y", and "Z" dimensional frame of reference, the primary static magnetic field having a magnetic field orientation in the "Z" direction;

(b) superimposing a focusing static magnetic field having a magnetic field orientation in the "Z" direction and having a selectable gradient in the "Y" direction on the primary static magnetic field to produce a resulting static magnetic field having a magnetic field orientation in the "Z" direction and having a known field configuration;

(c) providing a source of oscillating magnetic radiation having a selectable frequency;

(d) selecting a frequency ω_o of the source of oscillating magnetic radiation to satisfy the equation:

$$\omega_o = |H_o|\gamma$$

where:

ω_o = resonance angular frequency of the selected nuclei

$|H_o|$ = magnitude of resulting static magnetic field at a particular location

γ = gyromagnetic ratio for the selected nuclei and is a constant for the selected nuclei

for the selected nuclei at a resonance domain located within the resulting static magnetic field where the field strength is substantially $|H_o|$;

(e) positioning the specimen such that the resonance domain impinges on the specimen;

(f) orienting the oscillating magnetic radiation having frequency ω_o in a direction such that its magnetic field orientation is orthogonal to the "Z" direction;

(g) directing the oscillating magnetic radiation to the resonance domain whereby a nuclear magnetic resonance signal is generated for the selected nuclei in the specimen located within the resonance domain;

(h) receiving the nuclear magnetic resonance signal generated; and

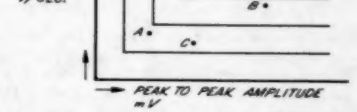
(i) processing the nuclear magnetic resonance signal to determine a nuclear magnetic resonance value representing the selected nuclei extant in the resonance domain within the specimen.

4,411,271

BODY TISSUE DEPOLARIZATION EVALUATION SYSTEM

H. Toby Markowitz, Anoka, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Feb. 10, 1982, Ser. No. 347,522
Int. Cl.³ A616 5/04
U.S. Cl. 128—703 **15 Claims**



1. An evaluation system for use in conjunction with a body implantable body stimulator, the body stimulator including a stimulaton delivering and depolarization sensing lead system, said evaluation system comprising:

input means adapted for connection to said lead system;

means for digitizing depolarization signals sensed by said lead system;

computing means including means for identifying excursions in the digitized depolarization signals and means for evaluating identified excursions in accordance with a preselected plurality of merit criteria; and

output means for giving an indication of at least that excursion having the highest merit that satisfies said merit criteria.

4,411,272

MINIATURE, BATTERY-POWERED CATHODE RAY TUBE DISPLAY HEART MONITOR

Jerry A. Phelps, Sr., 6013 Innes Trace Rd., Louisville, Ky. 40222

Filed Sep. 9, 1981, Ser. No. 300,610
Int. Cl.³ A61B 5/04
U.S. Cl. 128—711 **1 Claim**

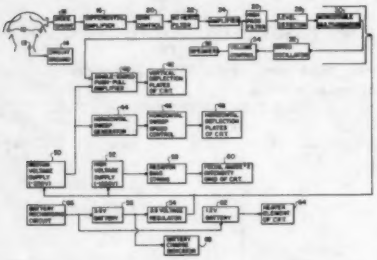
1. An cardioscope apparatus for detecting the electrical heart activity of a patient and for producing output in accordance therewith for presentation both by an associated cathode ray tube and an associated audio output device, said apparatus comprising:

electrode means, adapted to be connected to the body of a patient, for detecting the electrical activity of the patient's heart;

a differential amplifier connected to said electrode means;

a diode shunt connected across the input of said differential

amplifier to protect the differential amplifier from circuit overloads;
a passive 60 Hertz filter for filtering the output of said differential amplifier;
a further amplifier for amplifying the output of said filter;
a gain control circuit separate from said further amplifier for enabling continuous adjustment of the gain of the output of said differential amplifier;
a passive high pass filter connected to the output of said further amplifier;
a monostable multivibrator for receiving as an input thereto the output of said high pass filter;
a level detector for adjusting the input to said monostable multivibrator;
a gated oscillator, including a plurality of Nand gates, connected to the output of said monostable multivibrator;
an audio output device connected to the output of said oscillator;



a volume control circuit for adjusting the volume of the output signal produced by said audio output device;
a single ended push-pull amplifier connected to the output of said further amplifier for supplying a control voltage to the vertical deflection plates of the said associated cathode ray tube, and
power supply means, comprising only positive voltage batteries, for supplying the necessary supply voltages for the said associated cathode ray tube and the remainder of the circuitry for the apparatus, said power supply means including a voltage regulator for regulating the voltages supplied, said apparatus further comprising a horizontal sweep generator connected to said power supply means and the horizontal deflection plates of the cathode ray tube and, including means for adjusting the horizontal sweep speed.

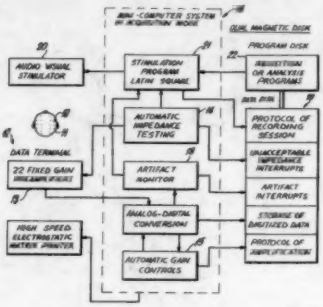
4,411,273

SYSTEM AND METHOD FOR ELECTRODE PAIR DERIVATIONS IN ELECTROENCEPHALOGRAPHY

E. Roy John, 930 Greacen La., Mamaroneck, N.Y. 10546

Filed Jan. 30, 1978, Ser. No. 873,118
Int. Cl.³ A61B 5/04
U.S. Cl. 128—731 **4 Claims**

1. A method in electroencephalography for the determination of the differences in electrical output representing brain waves between selected pairs of electrodes, the method comprising:
removably securing a plurality of electrodes to the head of said subject under test;
automatically presenting a selected program of external stimuli to said subject to obtain the subject's evoked responses thereto;
simultaneously amplifying the signals representing brain wave evoked responses from each of said electrodes;
converting the said amplified signals into digital form; and
computing the differences of said simultaneous amplified signals between a plurality of selected pairs of electrodes by selecting said pairs so that the same signals from each electrode are used in a plurality of said selected pairs and automatically subtracting one digitized signal from one



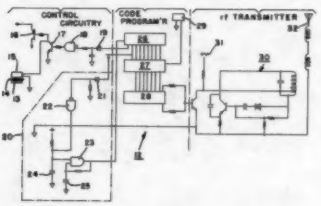
electrode of each of said pairs from the digitized signal from the other electrode of the same said pair, and displaying the said computed differences.

4,411,274

APPARATUS AND METHOD FOR MONITORING THE OESTRUS CYCLE IN FEMALE ANIMALS

Thad F. Wright, Yadkinville, N.C., assignor to Agricultural Computer Systems, Inc., Yadkinville, N.C.

Filed May 20, 1981, Ser. No. 265,551
Int. Cl.³ G07C 11/00
U.S. Cl. 128—738 **12 Claims**



1. Apparatus for monitoring the oestrus cycle in female animals comprising: a switch means positioned on the female signal, a transmitting means for attachment to the female animal communicating with said switch means, said transmitting means for generating a long range signal burst, said transmitting means including time delay circuitry, said time delay circuitry preventing signal transmission until a predetermined time lapse occurs from the time said switch means is initially activated independent of the length of switch activation, a receiving unit for receiving signals generated by said transmitting means, said receiving unit including a printing means for recording data from said transmitting means.

4,411,275

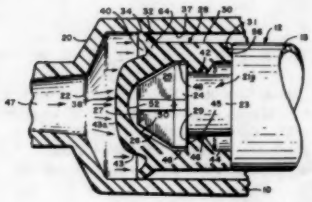
SYRINGE

Russell G. Raitto, Fitzwilliam, N.H., assignor to Concord Laboratories, Inc., Keene, N.H.

Division of Ser. No. 317,307, Nov. 2, 1981, Pat. No. 4,372,325, which is a division of Ser. No. 870,118, Jan. 17, 1978, Pat. No. 4,354,507, which is a continuation-in-part of Ser. No. 714,644, Aug. 16, 1976, abandoned. This application Nov. 22, 1982, Ser. No. 443,376
Int. Cl.³ A61B 5/14
U.S. Cl. 128—763 **1 Claim**

1. A method for taking a sample of blood using a disposable

syringe assembly particularly suited because of the low force requirement for the operation thereof to be used for obtaining a blood sample for a patient wherein said syringe comprises a barrel having a cylindrical inner wall and a plunger comprising a plunger stem and a compressible, elastomeric, generally cylindrical plunger tip of lesser diameter than the inner wall of said barrel, said plunger tip having an integral, annular elastically deformable wiper extending peripherally radially outwardly and axially forwardly from said plunger tip at a forward portion thereof at an acute angle to the longitudinal center axis of said plunger tip and terminating at the outer edge thereof in a wiping edge having a minimal diameter slightly in excess of the diameter of the inner wall of said barrel, thereby forming a sealing engagement with the inner wall of said barrel, said annular wiper being the sole sealing element between



said plunger tip and said wall, said plunger being spaced from said barrel along the length thereof so that axial movement between said plunger and said barrel is substantially free of frictional contact except for the contact by said sole sealing element, said syringe having a hypodermic needle attached thereto;

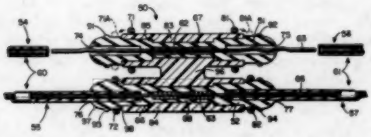
said method comprising moving said plunger tip axially forwardly to expel liquid anti-coagulant and air from said barrel until said plunger tip reaches its forward limit at which there is a predetermined space between said tip and said floor and at which a predetermined amount of said anti-coagulant remains in said barrel; followed by inserting said needle into a blood vessel of a patient and permitting the blood pressure in said blood vessel to move said plunger tip and plunger axially rearwardly in said barrel to take a sample of blood.

4,411,276

IMPLANTABLE MULTIPLE CONNECTOR

Eugene A. Dickhudt, and Roger A. Paulson, both of New Brighton, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 28, 1981, Ser. No. 258,259
Int. Cl.³ A61N 1/04
U.S. Cl. 128—784 **8 Claims**



1. A body implantable connector for connecting cut ends of a pair of body implantable leads, each lead including a helical conductor having a lumen, the helical conductor being encased in an insulator, the connector comprising:

sheath means made of a pliable rubber-like nonconductive material which is generally inert to body fluids, the sheath means being provided with a pair of open ends shaped for closely receiving cut ends of the leads and for frictionally fitting about the insulators of the leads in a generally fluid-tight connection, the material having sufficient strength to resist breaking under the forces normally exerted on the connector while implanted, but being sufficiently pliable to deform and so that the sheath means contracts about the leads under the frictional forces created between the sheath means and the insulators when the leads are urged in directions tending to separate them from the connector; and

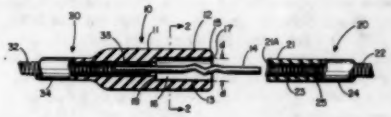
a wire means mounted in the sheath means and projecting within the open ends for mating in each lumen and including means for making conductive and mechanical connections between the helical conductors.

4,411,277

IMPLANTABLE CONNECTOR

Eugene A. Dickhudt, New Brighton, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Apr. 28, 1981, Ser. No. 258,260
Int. Cl.³ A61N 1/04
U.S. Cl. 128—784 **8 Claims**



1. A body implantable connector for connecting to a cut end of a body implantable lead which includes a helical conductor having a lumen, the helical conductor being encased in an insulator, the connector comprising:

sheath means made of a pliable rubber-like nonconductive material which is generally insert to body fluids, the sheath means being provided with a generally cylindrical open end shaped for closely receiving a cut end of the lead and for frictionally fitting about the insulator of the lead in a generally fluid-tight connection, the material having sufficient strength to resist breaking under the forces normally exerted on the connector while implanted, but being sufficiently pliable to deform so that the sheath means contracts about the lead under the frictional forces generated between the sheath means and the insulator when the lead is urged in a direction tending to separate the lead from the connector; and

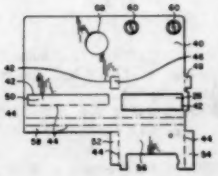
wire means mounted in the sheath means and projecting within the open end for mating in a lumen and including means for making a conductive and mechanical connection to the helical conductor.

4,411,278

CIGARETTE MAKING MACHINE

Arnold Kastner, 10220 Armand Lavergne, Montreal, Quebec, Canada

Filed Jul. 24, 1981, Ser. No. 286,539
Int. Cl.³ A24C 5/02, 5/66, 5/42
U.S. Cl. 131—70 **6 Claims**



1. In a cigarette making machine of the type wherein a supply of tobacco for a single cigarette is compacted into cylindrical form within a tobacco compacting chamber which tobacco form is then axially moved by an elongate spoon and

injected by the spoon into a preformed cigarette tube positioned exteriorly of the machine on a hollow nipple,

the improvement wherein movable component parts of the machine are carried by an assembly plate comprising a single blank of sheet metal, upper and lower spaced and parallel surfaces of the tobacco compacting chamber and guide means for guiding movement of the spoon comprising bent portions of the single blank, wherein said assembly plate is carried within and secured to an outer plastic shell, said shell including locator projections which are deformed into firm contact with said assembly plate.

4,411,279

SMOKING PRODUCT AND PROCESS FOR MANUFACTURING SAME

Julian R. Martin, Winston-Salem, and Larry W. Sides, Welcome, both of N.C., assignors to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Division of Ser. No. 155,816, Jun. 2, 1980, Pat. No. 4,326,543. This application Nov. 25, 1981, Ser. No. 324,753

Int. Cl.³ A24C *5/56*; A20C *5/58*

U.S. Cl. 131—94 **14 Claims**

1. A process for manufacturing a filter-tipped smoking product from a rod-shaped wrapped section of tobacco, a rod-shaped non-wrapped fibrous filter and a web of tipping paper which comprises:

(a) applying to at least 30 percent of the surface area on one side of the web of tipping paper between 10 and 60 grams of a hot-melt adhesive per square meter of said surface area actually coated, the quantity of adhesive applied to said surface area being sufficient to provide an adhesive coating thickness of at least 8 microns and the combined thickness of the tipping paper and adhesive coating applied thereto being no more than 125 microns,

(b) cutting the adhesive-coated tipping paper into segments of predetermined length,

(c) moving the wrapped section of tobacco and the non-wrapped fibrous filter into abutting, axial alignment,

(d) heating the adhesive-coated segment of tipping paper sufficiently to activate the adhesive and bringing the adhesive-coated side thereof into contact with the non-wrapped fibrous filter and the abutting end of the section of tobacco,

(e) wrapping the segment of tipping paper coated with the heat-activated adhesive in sealing engagement around the non-wrapped fibrous filter and the abutting end of the section of tobacco so that substantially the entire length of the filter and the abutting end of the section of tobacco are circumferentially enveloped by the tipping paper, and

(f) maintaining the wrapped segment of tipping paper in sealing engagement with the non-wrapped fibrous filter and the abutting end of the section of tobacco for a sufficient time period to permit cooling and setting of the heat-activated adhesive in the assembled filter-tipped smoking product.

4,411,280

VENTILATED THERMOPLASTIC POLYMER FOAM FILTER RODS

Terry S. Floyd, Clover, S.C.; Donna G. Rhoden, Charlotte, N.C., and Walter E. Bradley, Fort Mill, S.C., assignors to Celanese Corporation, New York, N.Y.

Filed Sep. 11, 1981, Ser. No. 301,251

Int. Cl.³ A24D *3/04*

U.S. Cl. 131—332 **7 Claims**

7. A cigarette filter rod comprising a cellulose acetate substantially opened-cell foam characterized by the presence of at least some cells which are bridged by fibrils, said rod being surrounded by a water and air pervious high density skin structure having a discontinuity such as to produce a rod ventilation of greater than 85 percent, said discontinuity being in the form of pores having an average size of from about 50 to 150 microns and frequency of from 15 to 500 pores per square

millimeter, said pores being randomly disposed in the skin structure.

4,411,281

HAIRDRESSING DEVICE FOR STYLING, WINDING AND DRYING HAIR

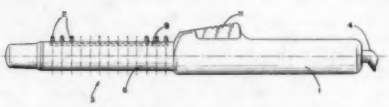
Klaus Doern, Essen-Bredeney, Fed. Rep. of Germany, assignor to Wik Elektro-Hausgerate Vertriebsgesellschaft mbH & Co., Productions-KG, Essen, Fed. Rep. of Germany

Filed Jul. 28, 1982, Ser. No. 402,822

Claims priority, application Fed. Rep. of Germany, Feb. 9, 1982, 3204469

Int. Cl.³ A45D *2/24*

U.S. Cl. 132—37 R **8 Claims**



1. In a hairdressing device having a handle and a round brush presenting bristles distributed on its circumference, the round brush including an inner tube, an outer tube and, on the inner tube, rows of bristles swingably mounted, the bristles penetrating the outer tube to an extended position or being retracted within the outer tube by relative rotary movement between the inner tube and the outer tube, the improvement comprising:

(a) a depressable operating key mounted on the handle and having an operating cam;

(b) said operating cam being effective, when the operating key is depressed, to act against a follower member mounted on said inner tube and rotate said follower member, rotation of said follower member being effective to rotate one of said inner and outer tubes relative to the other of said inner and outer tubes; and

(c) a restoring spring connecting said inner and outer tubes;

(d) release of said operating key permitting said spring to reset said outer tube to a starting position relative to its said inner tube and effect the extension of said bristles through said outer tube.

4,411,282

MASCARA APPLICATOR WAND AND RECEPTACLE

Karen A. Wavering, Chicago, Ill., assignor to W. Braun Company, Chicago, Ill.

Filed Mar. 15, 1982, Ser. No. 357,978

Int. Cl.³ A45D *40/30*

U.S. Cl. 132—88.5 **13 Claims**

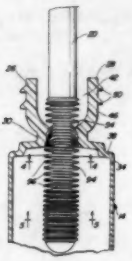
1. A mascara applicator wand assembly comprising an elongated rod having an upper handle end and having a lower applicator end, said lower applicator end including applicator means for applying mascara to eyelashes for cosmetic purposes,

said applicator means comprising disk-like rings distributed

as a coaxial array attached to and encircling said rod means at said lower applicator end thereof,

said rings including resiliently flexible radially outwardly directed marginal rib portions having convex peripheral edges,

said rings defining therebetween continuous annular grooves



opening outwardly for retaining controlled amounts of mascara for cosmetic application,

said annular grooves including grooves of varying radial depth distributed axially along side applicator end of said rod to provide shallow and deeper recesses between said rings for retention of lesser and greater amounts of mascara to be applied cosmetically.

4,411,283

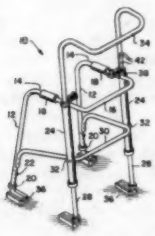
INVALID WALKER

Frank J. Lucarelli, 1017 Western Trail, Keller, Tex. 76248

Filed Dec. 30, 1981, Ser. No. 335,629

Int. Cl.³ F16M *13/08*

U.S. Cl. 135—67 **10 Claims**



1. An invalid walker suitable for use on level or inclined surfaces, or for up and down stairs including the combination of rear legs members, side supports, top and bottom supports and feet, the improvement comprising an adjustable front leg assembly including a pair of guide tubes attached to said support members, front legs telescopically movable upwardly and downwardly within said guide tubes, an adjustment member attached to said front legs and movable therewith for moving said legs within said guide tubes, and locking means for locking said front legs within said guide tubes at preset locations.

4,411,284

WALKING AID TIP ASSEMBLY

Eric J. Opitz, 31280 Ramble Rd., Franklin Village, Franklin, Mich. 48025

Filed Nov. 19, 1981, Ser. No. 323,051

Int. Cl.³ A45B *9/04*

U.S. Cl. 135—81 **1 Claim**

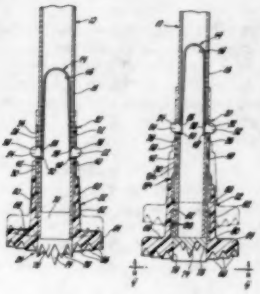
1. An attachment for the groundward end of a walking aid comprising:

a ground-engaging member fixedly secured in said groundward end of said walking aid and having a spike extending in the groundward direction therefrom;

a sleeve slidably secured about said groundward end of said walking aid and axially moveable relative thereto, said sleeve having three annuli of holes spaced therealong;

a resilient foot securely mounted on said sleeve and below said annuli of holes, said foot having an outwardly projecting annular flange at the groundward end thereof and having a ground engaging surface at the groundward end of said flange, said surface having a plurality of annular grooves therein;

and latch means in said walking aid and selectively engageable with holes in one of said annuli of holes to secure said sleeve and said foot in one position relative to said walking aid and said ground engaging member to permit engagement of said spike on said ground engaging member with the ground and



separate said ground engaging surface of said foot from the ground, said latch means being selectively moveable to engage holes in another annuli of holes in said sleeve to secured said sleeve relative to said groundward end of said walking aid and said spike on said ground engaging member in a second position separating said spike from the ground and engaging said ground engaging surface of said foot with the ground, and said latch means being selectively moveable to engage holes in another of said annuli of holes in said sleeve to secure said sleeve relative to the groundward end of said walking aid and said ground engaging member in a third position engaging both said spike and said ground engaging surface of said foot with the ground, said annuli of holes additionally permitting said sleeve and foot in any of said three positions to be rotationally indexed so as to compensate for wear on any given portion of the ground engaging surface of said foot.

4,411,285

DEMAND VALVE

Hugh H. B. Oswell, Hexham, England, assignor to Submarine Products Limited, Northumberland, England

Filed May 18, 1981, Ser. No. 264,401

Claims priority, application United Kingdom, May 20, 1980, 80166979; Jun. 27, 1980, 8021211

Int. Cl.³ G05D *11/00*; A62B *7/04*

U.S. Cl. 137—112 **12 Claims**

1. A valve comprising:

a housing;

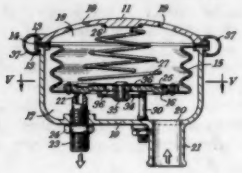
a flexible diaphragm operatively positioned within said housing for forming first and second chambers;

said first chamber being in communication with an external pressure source;

a first port and a second port being operatively positioned within said second chamber;

said flexible diaphragm including a substantially rigid, planar portion affixed thereto and forming a port closure surface for engaging and closing said first port, said flexible dia-

phragm and said first port being so disposed relative to one another that the port closure surface contacts the first port at a location spaced from the centre of pressure of the flexible diaphragm, whereby establishment of an operative difference of pressure across the flexible diaphragm causes the flexible diaphragm to pivot so as to unseat the closure surface and thereby open said first port; and



low pressure relief safety valve means including a valve member mounted on the planar portion and movable in response to a pressure difference thereacross to relieve excessively low pressures in the second chamber by permitting said external pressure in said first chamber to flow into the second chamber.

4,411,286

LIQUID SEAL VALVE

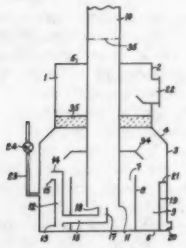
Gerald G. Ball, London, England, assignor to Peabody Holmes Limited, Huddersfield, England

Filed Feb. 27, 1981, Ser. No. 238,921

Claims priority, application United Kingdom, Mar. 6, 1980, 8007688

Int. Cl.³ F16K *9/00*

U.S. Cl. 137—253 **6 Claims**



1. A liquid seal valve comprising a first vessel having a lower part which includes a closed bottom and a wall extending upwardly from said bottom and a gas outlet from an upper part of the vessel, a second, open-topped vessel within the lower part of said first vessel, said second vessel having a wall extending to said closed bottom end spaced upwardly from said wall of the first vessel providing a radial gap between said walls of said first and second to vessels, a gas inlet pipe extending downwardly through said upper part of the first vessel and through the open top of said second vessel into a liquid trap in said second vessel, the lower end of said gas inlet pipe being disposed below the level of the surface said liquid trap when there is no gas flow through said inlet pipe, whereby gas entering the valve via said inlet pipe can flow via said second vessel to the gas outlet in said first vessel, and pipe means providing communication between the lower end of said gas inlet pipe and at least two regions in said first vessel, said pipe means including a first, open-ended pipe externally of, and to one side of, said second vessel, said first pipe being disposed in said radial gap and having a smaller cross-sectional area than said second vessel, said first pipe having a first open end below said level and a second open end above said level, and a second pipe connected to said first pipe intermediate the first and second open ends of the latter, said second pipe leading from said first pipe to the interior of said second vessel and having an open end opposite to, and adjacent to, the lower end of said gas inlet pipe.

4,411,287

VALVE-TYPE CLOSURE FOR CONTAINERS

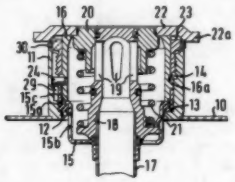
Roger J. Hyde, Kettering, England, assignor to Alumasc Limited, London, England

Filed Apr. 16, 1981, Ser. No. 254,932

Claims priority, application United Kingdom, Apr. 22, 1980, 8013176

Int. Cl.³ F16K *51/00*; F16L *37/00*; B65D *83/00*

U.S. Cl. 137—315 **8 Claims**



1. A closure arrangement for a metal container comprising in combination a neck adapted to be rigidly secured to said container, a screw-threaded socket internally of said neck, and a valved closure to be screw-threaded into said socket; a construction of said valved closure comprising a tubular body, a closure valve housed within said body to control fluid flow therethrough, a sleeve rotatably mounted exteriorly on said body, means locating said sleeve against axial displacement of said sleeve on said body, said sleeve having an external screw-thread to engage said internal screw-thread of said socket, and a guiding connection between said tubular body and said neck to restrict rotation of said body in said neck and allowing axial travel of said body into said neck to a fully-inserted position on screwing-in of said sleeve, and said guiding connection including body-retaining means operative to limit axial travel of the body from the fully-inserted position on occurrence of rotation of the body in the neck in the unscrewing direction on unscrewing the sleeve; and pressure-gas relief means including a gas passage, and a seal operative to close the gas passage in said fully-inserted position of the body, said gas passage being opened around said seal on travel of the body axially from the fully-inserted position.

4,411,288

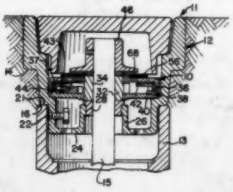
VALVE POSITION INDICATOR WITH VARIABLE INDICATOR PLATES

Lorand H. Gain, Jr., Montgomery, Ill., assignor to AMSTED Industries Incorporated, Chicago, Ill.

Filed Jul. 27, 1981, Ser. No. 287,423

Int. Cl.³ F16K *1/28, 37/00*

U.S. Cl. 137—363 **4 Claims**



1. In a valve position indicator for a buried valve having an

operating shaft extending to ground level and requiring a predetermined number of turns to move said valve between the open and shut positions thereof, said position indicator including a housing mounted on the upper end of said extended operator shaft and having a transparent wall, an interior indicating member disposed in said housing so as to be visible through said transparent wall and operatively connected to said operating shaft and being incremental angularly displaced upon turning of said operator shaft to indicate the position of said valve relative to an open and closed position, the improvement comprising

an annular first indicia bearing plate means coaxially disposed about said operator shaft and fixed to said transparent wall of said gear box unit, said first indicia means having a first reference tab means located relative to said interior indicating member to indicate one of said open or shut positions,

an annular second indicia bearing plate means superimposed on said first member having a second reference tab means selectively angularly spaced from said first reference means of said first indicia bearing plate to indicate the other of said open or shut positions,

said second indicia bearing plate means being disposed on said first indicia bearing plate means so that the angular spacing first reference tab means and said second tab means corresponds to the aggregate angular displacement of said interior indicating member between the open and closed positions of said valves upon turning said operator shaft the predetermined number of turns.

4,411,289

HYDRAULIC VALVE

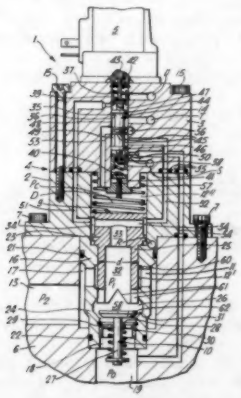
Ronald B. Walters, Wembley, England, assignor to Sperry Limited, Cobham, England

Filed Jul. 24, 1980, Ser. No. 171,893

Claims priority, application United Kingdom, Jul. 26, 1979, 792162

Int. Cl.³ F16K *31/06, 31/143;* F15B *13/16*

U.S. Cl. 137—486 **10 Claims**



1. A hydraulic control valve comprising a main valve having a main valve inlet port and a main valve outlet port incorporating a fluid pressure actuated stepped valve piston located in a matching valve cavity and having a first and second ends of first and second effective end areas respectively with the second end area being smaller than the first end area, and a variable metering orifice provided by cooperation of the second end with said main valve outlet port; a pilot valve provided with flow setting means acting on pilot valve fluid control means through which a controlled proportion of fluid pressure acting in operation of the valve on said second area is applied to said first end area of the valve piston, thereby to control the metering orifice, said pilot valve being a spool valve incorporating a valve spool which comprises two end lands and at least one central land, the central land cooperating with an associated control port to control the proportion of the fluid pressure applied to the first end area of the valve piston; flow sensing means between the inlet port and the outlet port providing a flow sensing orifice; and feedback transmission means comprising first and second internal fluid ducts through which a feedback pressure differential developed in operation across the flow sensing orifice is transmitted to respective ones of the two end lands of the valve spool, said pressure differential making the pilot stage responsive to flow feedback derived from said flow sensing means and applied via said feedback transmission means.

4,411,290

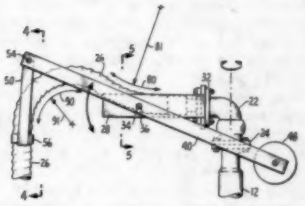
BOTTOM LOADING ARM FOR BULK LIQUID CARRIERS

Warren A. Heath, Sunnyvale, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Jun. 15, 1981, Ser. No. 273,309

Int. Cl.³ B65B *3/04*

U.S. Cl. 137—615 **5 Claims**



1. A loading arm for bottom loading or unloading of liquid between a storage tank and a bulk liquid carrier, such as a tank truck, which comprises:

a flexible conductor extending generally horizontally from a vertical supply standpipe adapted to be connected to a liquid storage tank;

elbow means, including a first end, rotatably mounted on said vertical supply standpipe and a second end for connecting one end of said flexible conductor to said standpipe;

flexible conductor support means mounted for horizontal rotational movement coaxial with the axis of rotation of said elbow means, said support means including horizontal arm means secured to said elbow means to extend substantially parallel to the axis of said elbow means second end and outwardly from said standpipe;

pivot arm means, said pivot arm means being mounted for vertically pivotal motion on said horizontal arm means, other pivot arm means for supporting the forwardly extending portion of said flexible conductor in a vertical position, said other pivot arm means being mounted for pivotal motion from one end of the first said pivot arm means, and counterweight means supported by the other end of said first pivot arm means and extending rearwardly of said standpipe to counterbalance said flexible conductor, the opposite end of said first pivot arm means, and said other pivot arm means;

means for securing the upper end of the vertically disposed portion of said flexible conductor to the pendant end of said other pivot arm means, and bulk liquid carrier connector means affixed to the other end of said flexible conductor whereby said liquid connector means may be engaged with, and disengaged from said bulk carrier by horizontal rotation of said loading arm assembly about said vertical standpipe and vertical and horizontal move-

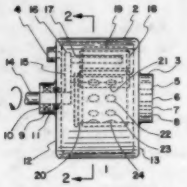
ments of said flexible conduit with said one and said other pivotal arm means, respectively.

4,411,291

ANGULAR BELT VALVE FOR MANIFOLD CONTROL

Hyok S. Lew, 7890 Oak St., Arvada, Colo. 80005

Continuation-in-part of Ser. No. 206,302, Nov. 12, 1980. This application Jul. 2, 1981, Ser. No. 279,678
Int. Cl.³ F16K *13/00, 31/52*
U.S. Cl. 137—624.15 5 Claims



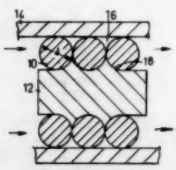
1. An angular belt valve comprising a cylindrical enclosure having ports for the fluid passage; a cylindrical manifold core disposed within said cylindrical enclosure, said cylindrical manifold core including a plurality of axial holes, each of which axial holes include first openings disposed on the outside extremity of said cylindrical manifold core and second openings disposed on the cyindrical side wall of said cylindrical manifold core; a planetary roller disposed within said cylindrical enclosure, said planetary roller revolvable about its own axis and rotatable around said cylindrical manifold core; a belt wrapped around said cylindrical manifold core and said planetary roller; means for generating relative rotational motion between said cylindrical manifold core and said planetary roller; a plurality of tightener rollers rotatable around said cylindrical manifold core and means for adjusting the relative positions between said planetary roller and said tightener rollers; whereby, the relative rotational motion between said cylindrical manifold core and said planetary roller opens and closes each of said second openings connected to each of said axial holes wherein said means for adjusting the relative positions between said planetary roller and said tightener rollers is used for adjusting the unwrap angle of said belt around said cylindrical manifold core and for tightening the tension on said belt.

4,411,292

FLUID FLOW RESTRICTOR DEVICE

Arminio Schiller, 15 Hamatmid St., Ramat Gan, Israel

Filed Nov. 30, 1981, Ser. No. 325,732
Int. Cl.³ F15D *1/02*
U.S. Cl. 138—42 10 Claims



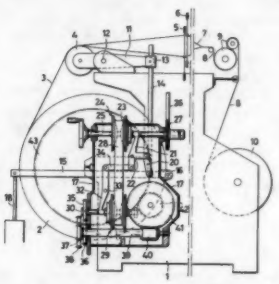
1. A fluid flow restrictor device including a spiral passageway defined by a closed spiral coil of wire disposed between an inner member contacting the inner face of the coil and an outer member contacting the outer face of the coil, there being a fluid inlet at one end of the spiral passageway and a fluid outlet at the other end of the spiral passageway, characterized in that the spirals of the coil are in contact with each other and are unbonded to each other such that they define with at least one of said members a spiral passageway of precise cross-sectional area, and in that at least one of said members is resiliently deformable to increase said cross-sectional area of the passageway and thereby to permit flushing the device.

4,411,293

DEVICE FOR KEEPING CONSTANT BOTH THE SPEED AND THE TENSION WHEN REELING OFF THE WARP THREAD FROM THE WARP BEAM IN A LOOM

Nicola Santucci, Schio, Italy, assignor to Nuovo Pignone S.p.A., Florence, Italy

Continuation of Ser. No. 882,239, Feb. 28, 1978, which is a continuation of Ser. No. 744,108, Nov. 22, 1976, abandoned. This application Oct. 26, 1981, Ser. No. 315,045
Claims priority, application Italy, Dec. 11, 1975, 30193 A/75
Int. Cl.³ D03D *49/06*
U.S. Cl. 139—110 1 Claim



1. A device for keeping constant the speed and the unreeling tension of the warp threads from the warp beam of a loom having a main shaft even when the speed is extremely low comprising:

a first variable-race input sheave mounted on a first rotatable shaft coupled to the loom main shaft and driven thereby,

a second variable-race output sheave mounted on a second rotatable shaft supported by said loom and having one end extending outwardly therefrom,

a V-belt connecting the first and second variable-race sheaves,

a third shaft rotatable mounted on said loom below said second shaft and having one end extending outwardly therefrom having a worm gear located thereon,

interchangeable and readily accessible gear means mounted on the outwardly extending ends of the second and third shafts and connecting the second shaft to the third shaft on the exterior of said loom, said gear means comprising a worm wheel coupled to the warp beam, a set of meshing spur gears, one of said spur gears being mounted on the second shaft with the second variable race sheave and being driven thereby and another spur gear in said set being mounted on a third shaft and having a worm thereon transmitting said drive to the worm wheel to drive said warp beam, and including coupling means engaging the worm gear and the warp beam to drive said warp beam for unreeling of the warp thread at a predetermined constant speed for the particular fabric being woven, a third of said spur gears comprising a pair of integtral, coaxially mounted spur gears drivingly interconnecting said one and said another spur gears and

linkage means directly connected to the two variable-race sheaves and in engagement with the warp threads, said linkage means simultaneously varying the races of the first and second sheaves to maintain the unreeling speed and tension of the warp threads by varying the speed of the warp beam at the output of the second variable sheave, said linkage means comprising a drum onto which the warp threads being unreeled from the warp beam are

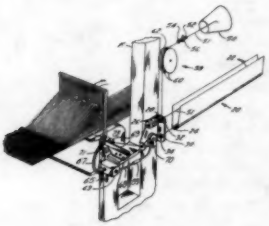
passed, a rocker supporting the drum at one end, a first bell crank level connected to the second output sheave to vary the races of said sheaves in opposite directions, a counterweight, and connecting means coupled to the other end of the rocker and to the counterweight to permit movement in response to the motion of the drum and wherein the bell-crank levers are connected to said means to vary the races of the sheaves in response to the tension of the warp threads.

4,411,294

METHOD AND APPARATUS FOR INSERTING WEFT FILAMENTS

Joseph R. Cornellier, P.O. Box 383, Station K, Montreal, Quebec, Canada

Continuation-in-part of Ser. No. 786,597, Apr. 11, 1977, Pat. No. 4,134,435. This application Jun. 26, 1978, Ser. No. 919,177
Claims priority, application Canada, Mar. 15, 1977, 273991
Int. Cl.³ D03D *47/32*
U.S. Cl. 139—435 **7 Claims**



1. An apparatus for advancing a weft filament, in a weaving apparatus, across warp filaments comprising a source of pressurized liquid, nozzle means for projecting said source of pressurized liquid in a stream across said shed, means for supplying a length of weft filament having a free leading end and in operative relationship to said source of pressurized liquid, whereby said stream of pressurized liquid is adapted to engage said leading end of said filament, means for actuating said source of pressurized liquid to provide a predetermined amount of pressurized liquid in the form of a stream directed across a shed, and means for interrupting the flow of said stream of pressurized liquid before said weft filament traverses the width of the shed, wherein said means for actuating the source of pressurized liquid and the means for interrupting the flow of the stream of pressurized liquid comprises a liquid supply assembly, said liquid supply assembly comprising a conduit leading from said source of pressurized liquid, a valve having a liquid inlet port, first and second liquid outlet ports, and a liquid passageway intermediate said liquid inlet port and said liquid outlet ports, said liquid inlet port being connected to said conduit, and a valve piston mounted in said liquid passageway, said valve piston being adapted to open and close said liquid passageway in conjunction with the motion of the weaving apparatus, said first liquid outlet port being connected to said nozzle, and said second liquid outlet port being in communication with a weft filament gripping means.

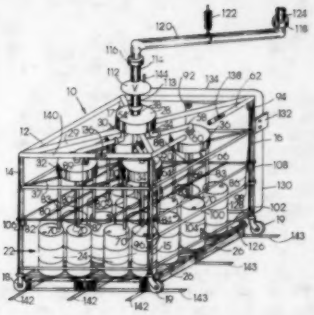
4,411,295

DEVICE FOR EQUALLY FILLING A PLURALITY OF CONTAINERS

Steven D. Nutter, #4 Cederedge Manor, Imperial, Mo. 63052

Filed Jul. 27, 1981, Ser. No. 287,284
Int. Cl.³ B65B *31/00, 37/18*
U.S. Cl. 141—59 **13 Claims**

1. A device for simultaneously equally filling a plurality of containers from a common source of fluid comprising a primary distributor including a top member having an inlet port positioned centrally thereon for connection to a source of fluid and a bottom member spaced from said top member, said bottom member having a plurality of equally angularly spaced outlet ports each also spaced an equal distance from said central inlet port, first conduit means communicating said inlet port with said common source of fluid, said first conduit means being positioned such that fluid will flow into said primary distributor in a direction substantially equally angularly related to each of said primary outlet ports, a plurality of secondary distributors located in a plane spaced below and parallel to the outlet ports of said primary distributor, each of said secondary distributors including a top member having an inlet port positioned centrally thereon and a bottom member spaced from said top member, each of the bottom members associated with said secondary distributors having a plurality of outlet ports equally spaced both angularly and radially from the inlet port



associated with the top member of each respective secondary distributor, second fluid conduits connecting each of the plurality of the outlet ports of said primary distributor to respective ones of the inlet ports associated with said secondary distributors, said second fluid conduits being of equal length and size and each being connected to respective ones of the inlet ports of said secondary distributors such that fluid will flow from said second fluid conduits into said secondary distributors in a direction substantially equally angulary related to each of the outlet ports of said secondary distributors, and third fluid conduits each having one end portion thereof connected to respective ones of the outlet ports of said secondary distributors for conducting fluid from each of said secondary distributor outlet ports into a respective container to be filled therefrom.

4,411,296

VALVE BAG PLACER

Will G. Durant, Tustin, Calif., assignor to W. G. Durant Corporation, Placentia, Calif.

Continuation-in-part of Ser. No. 155,920, Jun. 3, 1980, Pat. No. 4,334,558. This application Apr. 13, 1981, Ser. No. 253,978
The portion of the term of this patent subsequent to Jun. 15, 1999, has been disclaimed.
Int. Cl.³ B65B *43/18, 43/30*
U.S. Cl. 141—98 **10 Claims**

1. An improved bag placer apparatus for placing a bag or the like having a valve at an end thereof upon a filler spout through which the bag is to be filled with a flowable material, the apparatus of the type having means for withdrawing one such bag at a time from a plurality of such bags and having means for gripping the valve end of the withdrawn bag for opening the valve prior to placement thereof on the filler spout; the improvement comprising:

a bag registration apparatus for receiving each said one bag in a substantially horizontal position from said withdrawing means and for presenting each said one bag to said gripping means, and having means for automatically registering each said one bag for location of said valve end in

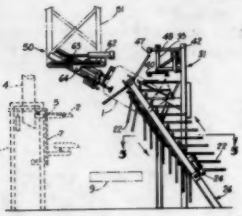
precise position and alignment relative to said gripping means;

wherein said means for automatically registering comprises:

means for utilizing the force of gravity to align a first edge of said bag in a first dimension, and

means for forceably aligning a second edge of said bag in a second dimension, said first and second edges of said bag being perpendicular to one another and lying in the plane of said bag, and

wherein said means for utilizing the force of gravity comprises:



a tiltable table adapted to receive said bag in a sustantially horizontal position and to tilt at an angle with respect to said horizontal position, said angle being sufficient to cause said bag to slide in the direction of said tilt, and

said tiltable table having an indexing means mounted to the top surface of said table for receiving the edge of said sliding bag in substantial alignment therewith, and

means for automatically applying selected indicia to each said bag on said registration apparatus.

4,411,297

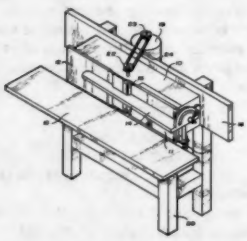
WOOD WORKING JOINTER DEVICE

Armas Veillon, 11925 Mockingbird La., Walker, La. 70785

Filed Oct. 4, 1979, Ser. No. 81,691

Int. Cl.³ B27C *1/02*

U.S. Cl. 144—129 **3 Claims**



1. A workbench for utilizing a small motor driven wood working jointer for the precision planing of edges of wooden workpieces comprising in combination: a support frame having an elongated horizontally disposed table assembly pivotally mounted thereon, at one side of said frame, said table assembly defining means for supporting and guiding a workpiece placed thereon, a vertically disposed upright wall-like member having opposite side faces attached to said support frame at a side opposite said table assembly; power means attached to said upright wall-like member on one side thereof; jointer means mounted on said upright member at an opposite side thereof and being disposed intermediate the length of said table assembly, said jointer means comprising rotatable wood working tool means operatively connected to said power means; and flat jointer face members disposed on opposite sides of said tool, said table assembly and said face members being perpendicularly disposed in non-overlapping relation.

4,411,298

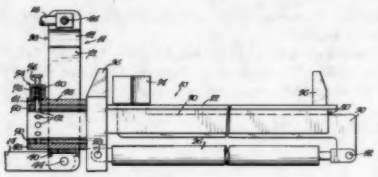
LOG SPLITTER MOUNTING ARRANGEMENT

Raymond L. Ellingsen, Oshkosh, and Dale A. Manteufel, Hortonville, both of Wis., assignors to J. I. Case Company, Racine, Wis.

Filed Oct. 9, 1981, Ser. No. 310,104

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—193 A **5 Claims**



4. A log splitter arrangement adapted to be mounted on a tractor hitch, comprising:

a log splitter having a linear working action including hydraulic motor means associated with blade means for providing relative linear movement of the blade means and an associated piece of wood to be split,

a hitch adapter adapted to be fixedly mounted on said hitch and supported thereby, and

mounting means for adjustably mounting said log splitter on said hitch adapter including female means on one of said hitch adapter and said log splitter, and male means on the other of said hitch adapter and log splitter, said male means being receivable by said female means, and releasable locking means for releasably locking said male and female means together in one of a plurality of relative dispositions, whereby said log splitter may be repositioned with respect to said hitch adapter about a line generally parallel to the line of working action of the log splitter and then maintained in fixed relation to said hitch adapter by said mounting means.

4,411,299

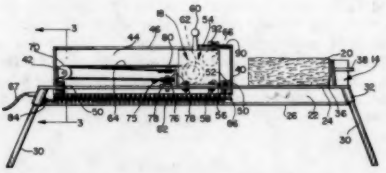
LOG SPLITTER

David K. Alcott, Reboboth, Mass., assignor to Haulamatic Corporation, East Providence, R.I.

Filed Mar. 8, 1982, Ser. No. 356,194

Int. Cl.³ B27L *7/00*

U.S. Cl. 144—193 R **13 Claims**



1. An apparatus for splitting wood comprising:

a. an elongated track;

b. a wedge mounted on said track;

c. a ram comprising:

(1) an abutment slidingly mounted on said track for movement generally toward and away from said wedge;

(2) a ram drive plate slidingly mounted on said track for movement generally toward and away from said wedge

but spaced from said abutment on the opposite side thereof from said wedge; and

(3) connecting means extending between said plate and said abutment communicating movement therebetween; and

d. drive means interposed between said abutment and said plate connected to said plate and to said track at a drive point which is spaced from said plate when said head is spaced from said wedge, said drive means advancing said plate toward said drive point and thereby advancing said head toward said wedge, whereby when a wood log is longitudinally disposed on said track between said head and wedge, the splitting thereof is effected by the advancement of said abutment with said drive means.

4,411,300

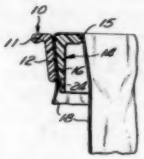
FLEXIBLE BAG WITH FRAME

Ezequiel Rico, 18092 Pamela Pl., Villa Park, Calif. 92667

Filed Jul. 18, 1980, Ser. No. 170,188

Int. Cl.³ B65D *33/14*

U.S. Cl. 150—51 9 Claims



1. An article receptacle, comprising: flexible bag;

an inner frame, sized to permit the mouth of said bag to be inserted through and folded over said inner frame;

an outer frame, independent of said inner frame, having a horizontal top leg with a bottom surface adapted to bear against the surface of a support member, said horizontal top leg terminating in a free end and a side surface oriented at an angle relative to said bottom surface, extending below said bottom surface;

said outer frame being sized, and said inner and outer frames being formed to nest together to permit said inner frame to be freely and easily removed from said outer frame by lifting said inner frame out of said outer frame, and permit said inner and outer frames to frictionally engage said bag therebetween by lowering said inner frame into said outer frame, said frames, when nested, positioned exclusively at the mouth of said bag without extending to the bottom of said bag, and

said inner and outer frames separate from and independent of said support member to allow said bag to be moved to a location remote from said support member without disengaging said bag from said frame.

4,411,301

TIRE TRACTION CHAIN

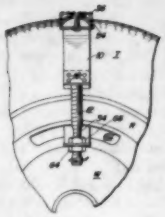
Paul Bindel, 3946 W. North Ave., Chicago, Ill. 60647

Filed Sep. 29, 1982, Ser. No. 428,150

Int. Cl.³ B60C *27/00*

U.S. Cl. 152—213 R 3 Claims

1. A tire traction chain comprising an arcuate band having an upper face, a pair of spaced permanently set arcuately shaped multiple parallel series of pronged links set cross-wise on said upper face of said band, a third set of multiple series of pronged links anchored flat on said upper face of said band medially between said arcuately shaped multiple parallel series of pronged links and cross-wise on the upper face of said band,



and means to removably anchor said band on an automobile tire.

4,411,302

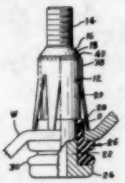
SNAP-IN TIRE VALVE

Harold A. Kuypers, Nashville, Tenn., assignor to Scovill Inc., Waterbury, Conn.

Filed Sep. 28, 1981, Ser. No. 306,286

Int. Cl.³ B60C *29/00*

U.S. Cl. 152—427 1 Claim



1. A tire valve comprising a rigid tubular body having an enlarged base and formed with a groove spaced from the base, gasket means having an annular flange portion and a tapered longitudinal extension surrounding the body adjacent the base, and an annular spring C-shaped clip surrounding and engaging the body in the groove and having a plurality of straight tapered spring fingers narrowing as their distal ends are approached extending outward and generally toward the base, whereby the valve can be inserted into a rim hole opening, smaller end first, so that the fingers flex inward toward the center of the valve until they are through the opening and then spring outward to trap the valve in the opening with the gasket in compressive sealing relation to the rim.

4,411,303

SAND MOLD-PRODUCING APPARATUS

Toshiyuki Shioda, Oobu, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Aichi, Japan

Filed Sep. 29, 1980, Ser. No. 191,422

Claims priority, application Japan, Oct. 1, 1979, 54-126964; Oct. 1, 1979, 54-126965; Jul. 10, 1980, 55-98372[U]

Int. Cl.³ B22C *15/28, 17/00*

U.S. Cl. 164—182 7 Claims

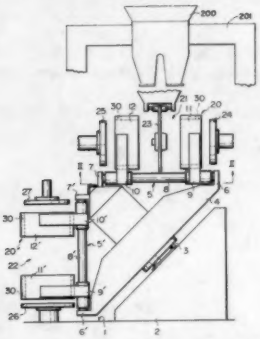
1. A sand mold-producing apparatus having a rigid base to establish therearound a mold-forming station and a mold-removing station, a sand blower means arranged in the mold-forming station for supplying molding sand under a pressure of air, a match plate carrying thereon a pattern or patterns and arranged to be movable in a predetermined direction perpendicular to the match plate, a flask device mounted on the base for holding a flask assembly for molding sand molds in the mold-forming station, and a sand-squeezing means having squeeze plates and actuator means for actuating a squeezing motion of the squeeze plates, wherein one squeeze plate re-

mains stationary during the sand squeezing operation, the sand-squeezing means being arranged in the mold-forming station for cooperating with the match plate and the flask assembly, wherein said flask assembly comprises:

a guide means fixedly held on said flask device and extending in a direction perpendicular to said match plate;

a pair of molding flasks for an upper and lower sand mold, said molding flasks being mounted on said guide means and slidable along said guide means from a predetermined first position in which said molding flasks are spaced apart from one another, toward a predetermined second position in which said molding flasks sandwich therebetween said match plate; and

a flask mover for mechanically interconnecting between said molding flasks while actuating a simultaneous slide motion of said pair of molding flasks, said flask mover being held by said flask device so as to be movable together with said match plate and said pair of molding flasks in said predetermined direction perpendicular to the match plate, wherein said flask mover comprises a single piston rod axially movably held on a bracket provided at one end of said flask device; a portion of the piston rod cooperating to urge piston rod passing through elastic means mounted on a side bracket, said elastic means and said portion of the piston rod cooperating to urge said piston rod toward the side of said bracket having said elastic means mounted thereon; a pair of spaced apart pistons arranged on said piston rod; and a pair of fluid-actuated cylinders slidably mounted on said piston rod, each of said pair of fluid-actuated cylinders housing therein one of said pistons and being connected to one of said molding flasks wherein the flask mover together with the match plate and the molding flasks are movable against the force of the elastic means in direct response to the squeezing movement of the sand-squeezing means, said pistons and cylinders being disposed on a side of said bracket remote from said elastic means.



4,411,304

DRIVING ROLLER STAND FOR CONTINUOUS CASTING PLANTS

Johannes Cordella, Linz, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

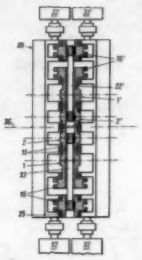
Filed Apr. 6, 1981, Ser. No. 251,246

Claims priority, application Austria, Apr. 15, 1980, 2026/80

Int. Cl.³ B22D *11/12*; B60B *15/16*

U.S. Cl. 164—448 **5 Claims**

1. In a driving roller stand arrangement for continuous casting plants having at least two adjacently arranged strand guides for casting at least two strands and comprising at least one separately driven drive roller for each strand, each driving roller being separately journaled on said driving stand, the arrangement including a first hollow driving roller having a first hollow driving element associated therewith, which first driving roller and first driving element define a hollow construction unit, a second driving roller having a second driving element associated therewith and being arranged coaxially with said first driving roller, and a driving shaft for driving said second driving roller, said driving shaft penetrating through said hollow construction unit, the improvement wherein:



said second driving roller and said second driving element are hollow and said driving shaft extends therethrough, and wherein there are provided within said second driving roller and said second driving element releasable engagement means which engage cooperating means on said driving shaft for rotation therewith, removal of said driving shaft simultaneously disengaging said second driving roller and said second driving element.

4,411,305

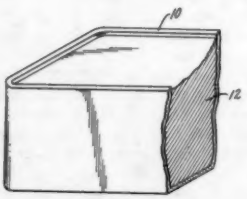
METAL FOUNDING

Robert H. Beetle, Mountain Lakes, N.J., assignor to Abex Corporation, New York, N.Y.

Filed Mar. 16, 1981, Ser. No. 244,110

Int. Cl.³ B22C *1/00*

U.S. Cl. 164—529 **7 Claims**



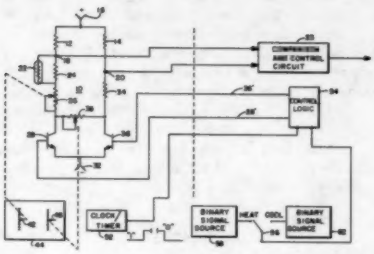
1. A foundry method comprising the step of casting molten metal into a rigid mold cavity represented by metal-confining exterior walls surrounding the mold cavity and substantially uniformly composed of a glass-ceramic in which the predominant microstructure is polycrystalline ceramic converted from the glassy state by devitrification, said polycrystalline ceramic existing as a single phase microstructure, said walls dissipating the heat of the casting in part by radiation, and repeating said step for a second casting of molten metal using the same mold.

5. A foundry mold having metal-confining walls extended entirely about a mold cavity and composed substantially uniformly of a glass-ceramic in which the predominant microstructure is a polycrystalline ceramic converted from a glassy state of devitrification, said polycrystalline ceramic existing as a single phase microstructure, and the interior surface of the mold walls being coated with a mold wash.

4,411,306
THERMOSTAT WITH IMPROVED TEMPERATURE SENSING CIRCUIT

John L. Kabat, Hennepin, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 29, 1981, Ser. No. 268,530
Int. Cl.³ F28F 27/00
U.S. Cl. 165—12 1 Claim



1. A thermostat with an improved temperature response circuit comprising in combination:

a temperature responsive circuit, said circuit having two power supply terminals with a temperature sensitive impedance in one circuit branch between said terminals and a calibration impedance in another circuit branch between said terminals;

a variable, set point, offset impedance;

a set point, offset control coupled to said offset impedance;

a control logic circuit;

means for selecting heating and cooling operating modes;

first means coupled to said logic circuit for producing an output signal of one binary significance when said heating mode is selected;

second means coupled to said logic circuit for producing an output signal of the other binary significance when a cooling mode is selected;

a timing circuit coupled to said logic circuit and producing a cyclical output signal of one binary significance for part of a cycle and the other binary significance for part of said cycle;

said logic circuit producing, respectively, a first control output, a second control output, or a third control output in response to the binary state of the output of said timing means, and the output of said first means and said second means; and

means responsive to said logic circuit outputs to connect said variable set point offset impedance in series with said temperature sensitive impedance in response to said first output, or in series with said calibration impedance in response to said second output.

4,411,307
WOUND TUBE HEAT EXCHANGER

Amir L. Ecker, Duncanville, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 29, 1981, Ser. No. 229,331
Int. Cl.³ F28D 7/02
U.S. Cl. 165—70 2 Claims

1. A double wall heat exchanger comprising:

a. a plurality of discrete conduits defining separate flow paths for respective fluids; said conduits having thin, heat conductive walls and being disposed contiguous another conduit; said conduits comprising a pair of conduits having respective D-shaped cross-section with the flattened areas of the D being placed back to back and contiguous each other for significant contact area rather than a mere line contact;

b. a plurality of windings per unit length holding said plurality of conduits in a bundle; said plurality of windings reinforcing said thin wall conduit walls and having respective tensile forces compressively holding said plurality of conduits contiguous adjacent conduits with said plurality

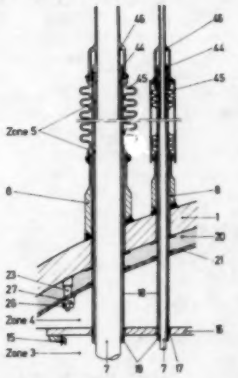
of windings effecting a plurality of respective effective force vectors per unit length; and

c. a lineal member traversing longitudinally intermediate the contiguous flattened areas.

4,411,308
VAULTED COVER ASSEMBLY TO CLOSE A VERTICAL RECESS IN A PRESSURE VESSEL

Reinhold Koerdt, Hemsbach; Hans-Georg Schwiers, Ketsch, and Josef Schoening, Hambruecken, all of Fed. Rep. of Germany, assignors to Hochtemperatur-Reaktorbau GmbH, Cologne, Fed. Rep. of Germany

Filed Jul. 20, 1981, Ser. No. 284,796
Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027510
Int. Cl.³ F28F 9/00; F22B 37/20, 37/24
U.S. Cl. 165—70 21 Claims

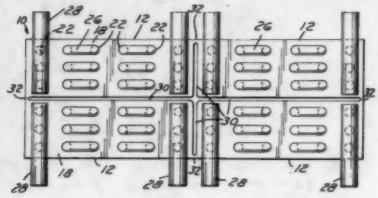


1. Vaulted cover assembly to close a vertical recess in a pressure vessel comprising a plurality of fittings welded to a cover member for the passage of steam pipes and having thermal insulation applied on the inside of the cover member, a support frame placed on a flange located within the recess in the vicinity of the cover member, said support frame consisting of at least one cylindrical section surrounding all of the steam pipes, and a horizontal plate covering the cylindrical section on top and having orifices for the steam pipes, each of said steam pipes being surrounded by a protective tube in the zone defined by said horizontal plate and said cover member, and forming an annular gap wherein said protective tubes are drawn on one side at least into the fittings and guided on the other side through the horizontal plate wherein said annular gaps between the steam pipes and the protective tubes are communicating at their lower ends with the space underneath the horizontal plate of the support frame.

4,411,309
HEAT EXCHANGER ASSEMBLY

Harold E. Kunkel, East Detroit, Mich., assignor to Ex-Cell-O Corporation, Troy, Mich.

Filed Mar. 16, 1981, Ser. No. 244,459
Int. Cl.³ F28F 9/00
U.S. Cl. 165—76 4 Claims

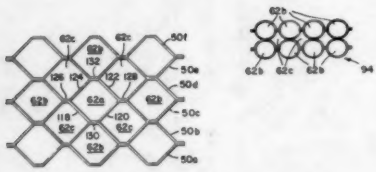


1. A heat exchanger arrangement comprising a plurality of individual heat exchanger assemblies, each including a separate fin pack confined between a pair of unitary end plates, a plurality of openings formed in said end plates, a plurality of tubes extended through said openings, a plurality of end segments interconnecting adjacent pairs of tubes of each heat exchanger assembly, said plurality of individual heat exchanger assemblies being arranged as a predetermined number of adjacent pairs, and connector means integrally interconnecting adjacent end plate outer corners only of each adjacent pair of assemblies.

4,411,310
HEAT EXCHANGE APPARATUS HAVING THIN FILM FLEXIBLE SHEETS

Clifford R. Perry, Renton; Lloyd H. Dietz, Seattle, and Roger L. Shannon, Federal Way, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 894,255, Apr. 7, 1978, abandoned. This application Oct. 24, 1980, Ser. No. 200,510
Int. Cl.³ F28F 3/00
U.S. Cl. 165—166 16 Claims



1. A heat exchange apparatus adapted for use either as a counterflow heat exchanger, a coflow heat exchanger or a condenser/evaporator type heat exchanger, said apparatus comprising:

a. a unitized heat exchanger structure, having a longitudinal axis, a lateral axis, and a vertical axis, said apparatus comprising:

1. a plurality of thin film flexible sheets aligned longitudinally and laterally with one another and spaced veritically from one another;

2. alternate pairs of said sheets being bonded one to another along a plurality of first longitudinally extending bond lines, positioned at predetermined laterally spaced first locations across said sheets;

3. intermediate pairs of said sheets being bonded one to another along a plurality of second longitudinally extending bond lines positioned at laterally spaced second locations across said sheets, each of said second bond lines being positioned laterally intermediate each of said first locations, each of said intermediate pairs of sheets being made up of adjacent sheets of adjacent alternate pairs of said sheets;

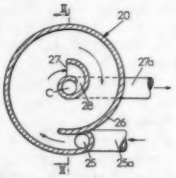
4. said sheets being arranged in an expanded pattern defining a plurality of generally diamond-shaped passageways arranged in vertical and lateral rows with respect to one another, each of said diamond-shaped passageways which are positioned in an interior location in said unitized structure being defined by four diagonally oriented single thickness sheet portions and two laterally oriented continuously and longitudinally extending double thickness bonded sheet portions;

b. means operatively connected to said unitized structure to direct a first heat exchange medium through a first set of alternately spaced rows, and to direct a second heat exchange medium through a second set of intermediate rows positioned alternately with the rows of the first set, whereby heat exchange is able to take place between said heat exchange medium across said diagonally oriented single thickness sheet portions.

4,411,311
HEAT EXCHANGE DEVICES FOR COOLING THE WALL AND REFRACTORY OF A BLAST-FURNACE

Francois Touze, Chateau de Logne, 57310 Guenange, France

Continuation-in-part of Ser. No. 120,912, Feb. 12, 1980, abandoned, which is a division of Ser. No. 906,210, May 15, 1978, Pat. No. 4,210,101. This application Apr. 1, 1981, Ser. No. 249,843
Claims priority, application France, May 25, 1977, 77 15939; Apr. 2, 1980, 80 07506
Int. Cl.³ F28F 3/14
U.S. Cl. 165—170 17 Claims



1. A heat exchanger comprising: a body having an inner chamber for the circulation of heat-transfer fluid, said chamber being shaped substantially as a chamber of revolution defined by first and second end walls and a curved peripheral wall extending therebetween, said first and second end walls being spaced from one another such that said chamber is substantially flat in shape, at least the first end wall being a heat-transfer wall; a supply port and a discharge port for the heat-transfer fluid, the ports being spaced-apart radially, the supply port being arranged and positioned to supply the heat-transfer fluid tangentially into the chamber and the discharge port being arranged and positioned to discharge the heat-transfer fluid tangentially from the chamber, so that, in use, the fluid flows between the ports in a spiral path over the inner surface of the first end wall, the chamber being free of internal obstacles to such flow.

4,411,312
WATER-TIGHT CONDUIT WELL CAP

Donald H. English, Mount Herman, N.J., assignor to Hewing Manufacturing Corporation, Columbia, N.J.

Filed Aug. 26, 1980, Ser. No. 181,875
Int. Cl.³ E21B 33/02, 41/00
U.S. Cl. 166—75 R 12 Claims

11. A pipe cover comprising:

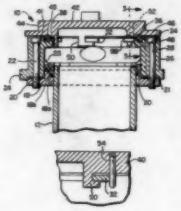
a base member,

means on an outer surface of said base member for attaching said base member to an end of a pipe,

cap means for covering said base member and said end, and having a hole for receiving a pin,

said cap means having means for securing said base to said cap means for one rotational position of said cap means with respect to said base member, and for releasing said base member for another rotational position,

said cap means having means for covering said means for attaching to prevent said means from being removed from



said pipe when said cap means is in said one rotational position, and for uncovering said means for attaching when said cap means is in said another rotational position, and

a pin for extending through said hole in said cap means to prevent relative rotation between said cap means and said base member when said cap means is in said one rotational position.

4,411,313

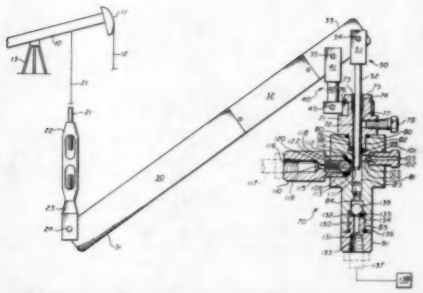
PUMP

J. Wallace Johnson, New Caney, and A. B. M. Abdul Hye, Kingwood, both of Tex., assignors to Liquid Level Lectronics, Inc., Houston, Tex.

Filed Oct. 19, 1981, Ser. No. 312,509

Int. Cl.³ E21B *43/00*

U.S. Cl. 166—90 **2 Claims**



1. A device for pumping production enhancing fluids from a fluid source into a well, said device comprising:

housing member having a bore therein forming a fluid reservoir and a fluid entry and a fluid exit port;

plunger means reciprocatingly insertable into one end of said bore;

means for providing production enhancing fluid from a fluid source to said fluid entry port;

means for evacuating said production enhancing fluid from said bore through said exit port, whereby said evacuated fluid subsequently enters said well;

both said means for providing and evacuating said fluid include said plunger means; and

means linking said housing member and said plunger means to a reciprocatable member of a production pump, said linking means comprising;

(1) connector member pivotally connected, near one end, to cable means, said cable means being connected to and reciprocating with said reciprocatable member of said production pump, said connector member also being pivotally connected to one end of said plunger means, and

(2) connecting rod pivoted at one end to said connector member intermediate said connector member's connections with said cable means and said plunger means said connecting rod being secured to said housing member by yoke means, said yoke means including an apertured portion permitting free relative rotation between said housing member and said yoke means; and

(3) means preventing relative axial movement between said housing member and said yoke means.

4,411,314

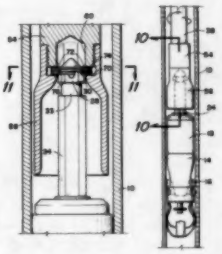
ATTACHMENT MEANS FOR USE FOR INSERTION AND RETRIEVAL OF A CASING PACKER

Billy G. Shearhart, Nowata, Okla., assignor to Sooner Oil Tools, Inc., Nowata, Okla.

Filed Jul. 27, 1981, Ser. No. 287,366

Int. Cl.³ E21B *23/00*

U.S. Cl. 166—124 **3 Claims**



1. For use with a retrievable packer positionable in a casing in which the packer has a vertical axial member extending upwardly therefrom, the packer being set by the rotation of the axial member in one direction and released from sealed relationship with the casing by rotation in the other direction, a retrieval tool for use on the lower end of a tubing string for releasing and retrieving the packer comprising:

an upstanding male location member having a non-circular peripheral configuration and having spaced from the upper end thereof an external circumferential groove of selected height, the lower end being affixable to the upper end of a packer axial member;

a retrieval tool of external diameter less than the interior diameter of the casing in which it is used and having means at the upper end for attachment to the lower end of a string of tubing extending from the earth's surface, the retrieval tool having an upper internal recess communicating with the tool open bottom, the recess being configured to slidably and non-rotatably receive the upper end of said male location member, the recess being defined in part by an internal, enlarged diameter groove of selected height so that when the upper end of said male location member is received in the recess in the retrieval tool, the grooves are in register; and

a plurality of clips each configured as the segment of a washer having thickness less than the height of said grooves in said location member and said retrieval tool, the clips being positioned in said internal recess in said retrieval tool and expandably outwardly in the groove to permit the upper end portion of said location member to pass and, when said groove on said location member is in register, to enter into the groove thereon whereby each

clip extends partially within both said grooves to axially lock said retrieval tool to said location member; and

means to resiliently inwardly bias said clips.

4,411,315

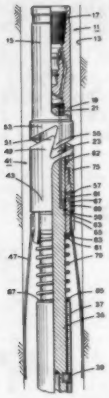
DRAG SPRING UNIT

Randy S. Baker, Long Beach, Calif., and H. R. Price, Calgary, Canada, assignors to Hughes Tool Company, Houston, Tex.

Filed Jun. 29, 1981, Ser. No. 278,915

Int. Cl.³ E21B *23/04, 23/06*

U.S. Cl. 166—187 **6 Claims**



1. An improved drag spring unit for well bore drill stem test tools of the type having an inflatable packer and an integral pump, said pump being activated by rotation of the drill stem in the well bore to inflate said packer, wherein the improvement comprises:

an outer drag spring housing;

an inner mandrel slidably received within said drag spring housing; and

clutch means associated with said outer housing and inner mandrel, said clutch means being positionable by sliding said inner mandrel within said drag spring housing between an engaged position which allows torque transmitted to said drag spring housing to be transmitted through the drill stem to said pump and a disengaged position which prevents transmission of torque.

4,411,316

SUBTERRANEAN WELL VALVE WITH LOCK OPEN MECHANISM

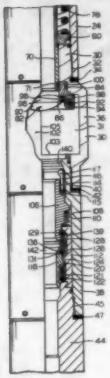
Michael A. Carmody, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Feb. 9, 1981, Ser. No. 232,473

Int. Cl.³ E21B *34/10*

U.S. Cl. 166—323 **12 Claims**

1. A valve assembly adaptable for mounting on a tubular conduit in a subterranean well, comprising, in combination: an annular housing defining a fluid flow path; a valve within said housing including annular valve seat means, and valve head means shiftable between open and closed position cooperating with said valve seat means to close said valve and said fluid flow path; first biasing means for urging said valve head means to closed position; shiftable valve actuating means for opening and holding open said valve against the bias of said biasing means; means for shifting said valve actuating means downwardly to open said valve head mean and means for shifting said valve actuating means upwardly for closing said valve head means; and releasable latch means for locking said valve actuating means in the open valve position, said latch means being shiftably mounted within said housing upstream of said



valve, said latch means being selectively passive to and during shifting of said valve actuating means.

4,411,317

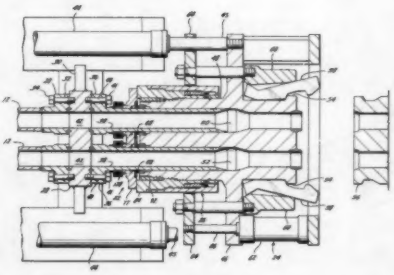
FLOWLINE CONNECTOR

Jimmie T. Gieswein, Houston, Tex., assignor to Cameron Iron Works, Inc., Houston, Tex.

Filed Nov. 2, 1981, Ser. No. 317,297

Int. Cl.³ E21B *43/013*

U.S. Cl. 166—347 **13 Claims**



1. A flowline connector for connecting between aligned, fixed, spaced-apart flowlines comprising

a flow tube having means for connecting to one of said flowlines,

a connector member surrounding and being slidably mounted on said flow tube and having a collet flange to mate with a collet flange on the other of said flowlines,

means for extending and retracting said connector member with respect to said flow tube,

means for remotely connecting the collet flange of said connector member to the collet flange on the other of said flowlines after said connector member has been extended into engagement with the other of said flowlines,

a metal seal ring for sealing between said flow tube and said connector member, and

pressure responsive means for actuating said seal ring to a releasable sealing position.

4,411,318
FIRE-EXTINGUISHING WASTE RECEPTACLE

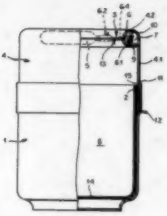
Walter Zeischegg, Turmstr. 43, 7910 Neu-Ulm, and Bernd Brussing, Öschwende 38, 7900 Ulm, Donau, both of Fed. Rep. of Germany

Filed Jul. 22, 1981, Ser. No. 285,750

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1980, 3027813

Int. Cl.³ A62C *35/02*

U.S. Cl. 169—26 **10 Claims**



1. A waste receptacle comprising:

an upwardly open vessel having an upper rim;

an annular head piece fittable over said rim and forming a vertically throughgoing waste-passing mouth;

a container in the form of a gas bottle mounted on said rim and holding a pressurized substance which when released at ambient pressure forms a gas that does not support combustion and that is heavier than air, said head piece forming an annular chamber containing said gas bottle;

a heat-conducting nozzle carried on said rim, connected to said container, and opening into said vessel;

a plug of fusible material blocking said nozzle and having a melting point below 80° C.

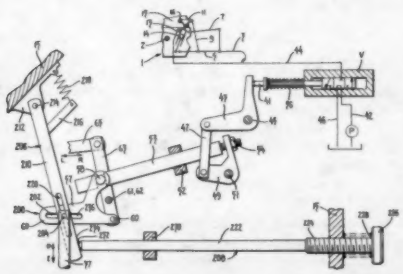
4,411,319
SENSITIVITY ADJUSTING APPARATUS FOR TRACTOR DRAFT SENSING AND CONTROL SYSTEM

Dale A. Wood, Canton, and Lee E. Elfes, Bloomfield Hills, both of Mich., assignors to Massey-Ferguson Inc., Detroit, Mich.

Filed Aug. 2, 1978, Ser. No. 930,486

Int. Cl.² A01B *63/112*

U.S. Cl. 172—10 **12 Claims**



1. A senstivity adjusting apparatus for adjusting the sensitivity of a tractor draft sensing and control system provided with a draft sensing mechanism and a draft control linkage, the draft sensing mechanism including a tractor housing **(15)** having spaced apart fulcrum supports, an elongated bendable shaft **(17)** mounted in the spaced apart fulcrum supports, draft members **(5)** connected to said shaft at points spaced outwardly of said tractor housing and operable to cause said shaft to bend when transmitting forces to said shaft, an elongated sensing arm assembly **(27, 28)** having a free end **(31)** and another end which is mounted on said elongated bendable shaft, and means to measure the movement of said free end, said measuring means including an output link **(37)** shiftable along its length in response to changes in draft; the draft control linkage having an input arm **(69)** mounted for movement about a pivot **(60)**; wherein the improvement comprises:

interconnecting structure on an upper end portion of said output link **(37)**; and

spaced apart connection locations **(234, 236)** on said input arm to which said interconnecting structure may be connected to vary the sensitivity of the draft control system.

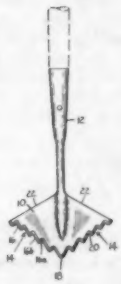
4,411,320
EDGING TOOL

Richard M. Hass, Portland, Oreg., assignor to Phyllis W. Hass, Tigard, Oreg.

Filed Mar. 8, 1982, Ser. No. 356,119

Int. Cl.³ A01B *3/06, 1/12*

U.S. Cl. 172—13 **1 Claim**



1. An edging tool comprising

(a) a flat blade having upper and lower edges,

(b) a handle secured to said blade centrally of the upper edge thereof,

(c) said lower edge consisting of a pair of cutting edges leading upwardly from a central point at an angle to each other,

(d) said upper edge consisting of a pair of straight stepping edges leading downwardly from said handle at an angle to each other,

(e) said stepping edges being substantially parallel with the opposite cutting edge,

(f) said cutting edges comprising scallop-type serrations formed by a pair of defining edges extending substantially at 90° to each other,

(g) a first of said defining edges leading laterally of said blade in a direction substantially parallel with said stepping edge on the same side thereof and said other defining edge extending at approximately 90° from said first defining edge and also inwardly of said cutting edge.

4,411,321
CULTIVATING IMPLEMENTS

Allan Riach, Ayton Mains, Eyemouth, Berwickshire, Scotland

Continuation of Ser. No. 181,238, Aug. 25, 1980, abandoned. This application May 27, 1982, Ser. No. 382,563

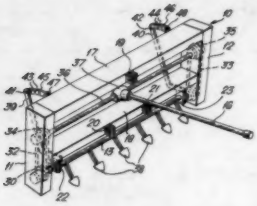
Claims priority, application United Kingdom, Aug. 25, 1979, 7929681; Jan. 30, 1980, 8003169

Int. Cl.³ A01B *33/02, 13/00*

U.S. Cl. 172—40 **7 Claims**

1. A cultivating implement adapted to be mounted from a ground-travelling vehicle, said implement comprising a frame having transversely spaced and opposed members, bearing means carried by said members, stub shafts adapted to be driven from a prime mover and supported in said bearing means in axial alignment along a generally-horizontal trans-

verse axis, a tine-carrying bar supported at opposite ends between said stub shafts for gyrating motion in a cylindrical path about said transverse axis in a direction counter to the direction of forward rotation of the ground wheels of a vehicle mounting the implement, the tines carried by said bar extending generally downward therefrom and having tips to which gyratory movement about a circular path wholly below said transverse axis and concentric with a second axis paralleling said transverse axis is imparted by said gyrating motion, the direction of tip movement below said second axis being the same as the forward direction of travel over the ground of a vehicle mounting the implement and being such as then to cause the tines to effect fast digging motions into the ground.



4,411,322

CULTIVATING MACHINE ROTOR

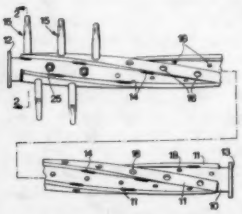
Barry A. Linger, Norfolk, England, assignor to Howard Machinery Limited, Harleston, England

Filed May 22, 1981, Ser. No. 266,154

Claims priority, application United Kingdom, May 29, 1980, 8017639

Int. Cl.³ A01B *33/14*

U.S. Cl. 172—540 **6 Claims**



1. A cultivating machine rotor comprising: a cylindrical wall forming a hollow rotary shaft of circular cross section; a fixing element consisting of a bar wrapped helically around and along the exterior of the shaft and secured to the shaft along its length; bores in and spaced along the fixing element; a first bore and a second bore in said cylindrical wall, each of said first and second bores being aligned with a bore in the fixing element and lying on opposite sides of the shaft; cultivating tools each with a shank arranged to be received in the aligned bores of the fixing element and the shaft so that the shank extends through the fixing element and bores radially of the shaft from one side of the shaft to the other and has an end portion protruding from said other side, and a working portion of each tool extending from the shank outwardly of the fixing element so the tools lie in a helical arrangement around the shaft; and securing means for each cultivating tool engageable with the aforesaid end portion of the shank.

4,411,323

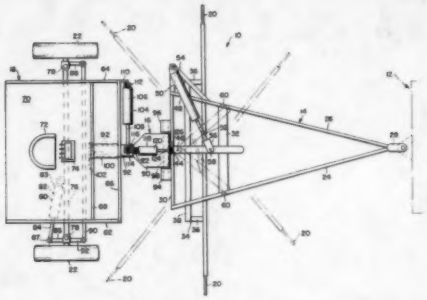
GRADING MACHINE

Harry L. Doss, Hill Church Rd., Tifton, Ga. 31794

Filed Jul. 13, 1981, Ser. No. 282,509

Int. Cl.³ E02F *3/76*

U.S. Cl. 172—799.5 **19 Claims**



1. A grading machine comprising a main blade support frame, a center connecting frame and a rear wheel support frame, said main frame extending longitudinally between a forward and a rearward end and having means for coupling the forward end to a vehicle, said center connecting frame being pivotably coupled to the rearward end of said main frame about a generally horizontal axis extending in a first direction transverse to the longitudinal direction of said main frame, and said center frame being pivotably coupled to said rear frame for motion about a second generally horizontal axis extending in said longitudinal direction whereby said rear wheel support frame is coupled to said main blade support frame for pivotal motion about two generally horizontal axes perpendicular to one another by way of said separate center connecting frame, a grading blade, means for connecting said grading blade to said main frame for pivoting motion about a vertical axis, ground contacting wheels carried by said rear wheel support frame, first powered means coupled between said main and center frames for pivoting said main frame about said first horizontal axis to adjust the vertical height of said grading blade with respect to the ground and said rear frame, and second powered means coupled between said rear and center frames for pivoting said main frame about said second horizontal axis to adjust the tilt of said grading blade.

4,411,324

BORE UNDERCUTTING TOOL

Heinrich Liebig, Wormser Strasse 23, 6102 Pfungstadt, BRD, Fed. Rep. of Germany

Filed Jun. 29, 1981, Ser. No. 278,558

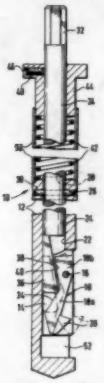
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1980, 3024656

Int. Cl.³ E21B *10/32*

U.S. Cl. 175—289 **12 Claims**

1. An undercutting tool for producing an undercut in a pilot bore of relatively small diameter in masonry, concrete, rock and the like; said tool having a tool shaft adapted to be inserted into the pilot bore and adapted to be driven in rotation, a single cutting tool having a cutting edge and so disposed in one end section of the shaft to be inserted into the bore that the cutting edge, after insertion of the tool shaft into the pilot bore, can be displaced gradually radially outwardly into the wall of the pilot bore, said cutting tool being disposed on a cutting tool holder in the form of a two-armed lever pivotingly mounted in a longitudinally disposed, slot-like recess which is open on one side only to the circumferential surface of said end section of the tool shaft, said cutting tool holder being adapted to be pivoted from a retracted position wherein said cutting tool is

retracted into the slot-like recess to a protruding position wherein said cutting tool protrudes from the tool shaft, a cutter feed shaft mounted so as to be longitudinally displaceable by a certain amount and co-rotationally in the tool shaft, said feed shaft having an outer end portion extending from the bore-outer end of the tool shaft, and a bore-internal end portion for engagement with said cutting tool holder, said cutting tool holder in the form of a two-armed lever having a backside opposite the cutting tool and a bore-internal first lever arm, a thrust surface on said first lever arm and running at an angle to the direction of displacement of the cutter feed shaft, a cutter



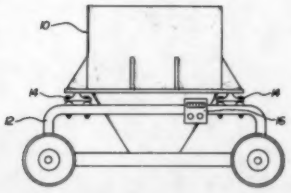
feed cam formed on the bore-internal end of the cutter feed shaft which cam is supported on the closed side opposite said one open side of said slot-like recess and adapted to engage said surface and, which, upon the displacement of the cutter feed shaft relative to the tool shaft into the bore interior, rocks the first lever arm of the cutting tool holder out of the recess of the tool shaft with an increasingly larger lever arm, said cutting tool holder having a second lever arm the backside of which has a thrust surface running at a slant opposite that of said first lever arm, which is engaged by the cutter feed cam upon a displacement of the cutter feed shaft relative to the tool shaft out of the bore interior.

4,411,325

LOAD BAR MOUNTING ASSEMBLY

Martin W. Hamilton, Arlington Heights, Ill., assignor to Eaton Corporation, Cleveland, Ohio

Filed Mar. 8, 1982, Ser. No. 355,706
Int. Cl.³ G01G *21/02*
U.S. Cl. 177—136 **20 Claims**



1. A load bar mounting assembly for mounting end portions of a load bar on a supporting structure which end portions each have a lower surface and define an aperture therethrough, the mounting assembly comprising:

a fulcrum member having a base side which is adapted to engage the supporting structure, a fulcrumming surface which is adapted to engage the end portion lower surface, and defining a fulcrum member aperture extending therethrough;

an elongated connecting means having an elongated central portion which is adapted to extend through the end portion aperture and the fulcrum member aperture, an enlarged portion adjacent one end for constraining separating movement of the end portion lower surface and the fulcrum surface, and a connecting means adjacent the other end which is adapted to be connected with the supporting structure; and,

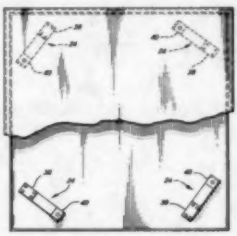
a resilient interconnecting means which is disposed adjacent at least a part of the elongated central portion and the enlarged portion and which is adapted to engage the load bar end portion adjacent the end portion aperture for resiliently interconnecting the load bar end portion and the elongated connecting means.

4,411,326

PLATFORM SCALE

Vernon Siegel, 5120 Brookfield La., Clarence, N.Y. 14031

Filed Feb. 4, 1981, Ser. No. 231,471
Int. Cl.³ G01G *3/14, 3/08*
U.S. Cl. 177—211 **3 Claims**



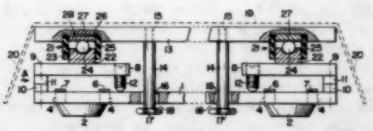
1. A platform scale comprising a base member having a central point; at least three elongated transducers having two ends operatively mounted upon said base member by one of their ends, said transducers being substantially equally spaced apart and having their mounted ends substantially the same radial distance from said central point and being tangentially arrayed with respect to said central point; the other end of said transducers carrying platform mounting means; and a platform mounted upon said platform mounting means.

4,411,327

APPARATUS FOR APPLYING A LOAD TO A STRAIN GAGE TRANSDUCER BEAM

Harry E. Lockery, Sudbury, and Eric Laimins, Belmont, both of Mass., assignors to Hottinger Baldwin Measurements, Inc., Framingham, Mass.

Filed May 14, 1981, Ser. No. 263,505
Int. Cl.³ G01G *3/14*; F16C *17/00*
U.S. Cl. 177—211 **8 Claims**



1. An apparatus for applying a load to a strain gage transducer beam in a platform scale, comprising first platform means (1), strain gage transducer beam means (3) forming integral components of said first platform means (1), second platform means (13) arranged above and substantially in paral-

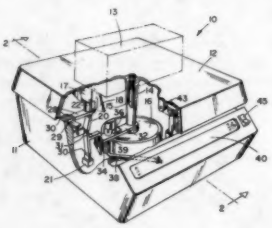
lel to said first platform means (1), force transmitting bar means (8), connecting means located between said first and second platform means for operatively securing said force transmitting bar means to the respective integral transducer beam means (3), first curved surface means (23) including at least one cup having a depression having a given radius of curvature, said cup being arranged between said first and second platform means, second curved surface means (24) including a ball having a radius of curvature smaller than said given radius of curvature of said depression, said second curved surface means (24) also being arranged between said first and second platform means for contacting said depression in said first curved surface means, and means operatively securing said cup to one of said platform means for cooperation with the ball for transmitting vertical force components effective on said second platform means (13) through said force transmitting bar means to said transducer beam means, said first and second curved surface means further cooperating for substantially freely yielding to any horizontal or angular force components effective on said platform means when the platform means shift horizontally due to a reduction in the axial length of the beam due to its deflection to thereby prevent such horizontal or angular force components from affecting the sensing by said integral strain gage transducer beam means while simultaneously transmitting said vertical force components.

4,411,328

LOW RANGE AUTOMATIC WEIGHING DEVICE

David W. Hubbard, Stamford, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Mar. 24, 1982, Ser. No. 361,310
Int. Cl.³ G01G *1/29*
U.S. Cl. 177—212 **15 Claims**



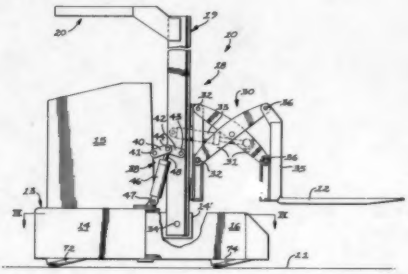
1. A weighing device comprising:
a frame;
a pan element for supporting a load to be weighed;
means connected to said pan for retaining a plurality of weight elements in a vertically movable manner;
a motor supported within said frame;
a shaft member operatively connected to and extending from said motor including means to support said pan element;
a plurality of collapsible support members, each of said support members secured at one end thereof to said frame and each having at their opposite ends means adapted to receive and lift one of said weight elements when said member is in an extended and non-collapsed position;
a camming arm secured to said shaft member and extending in a direction toward said support members; and
switching means for energizing said motor when said pan is depressed by a weighted load said motor turning said shaft member and guiding said camming arm into contact with successive collapsed support members in a step-by-step manner to place a number of said support members in an extended position and lift a corresponding number of said weights substantially equal to the weight of said load.

4,411,329

VEHICLE WITH MULTI-DIRECTIONAL MOVEMENT CAPABILITIES

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

PCT No. PCT/US82/00028, § 371 Date Jan. 11, 1982, § 102(e) Date Jan. 11, 1982, PCT Pub. No. WO83/02431, PCT Pub. Date Jul. 21, 1983
PCT Filed Jan. 11, 1982, Ser. No. 355,098
Int. Cl.³ B62D *57/00*; B60B *19/00*
U.S. Cl. 180—7 R **47 Claims**



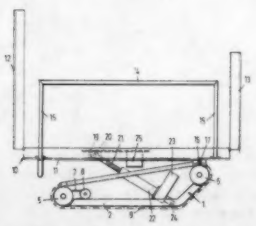
1. A vehicle (10) comprising:
a frame assembly (13);
a plurality of wheels (72,74) rotatably mounted on the frame assembly (13), each wheel (72,74) being mounted for rotation about a central axis (75);
means (109) for mounting each of the wheels (72,74) on the frame assembly (13) for universal adjustment about a pivot point (110);
means (149) for selectively and infinitely adjusting each of the wheels (72,74) about the pivot point (110); and
drive means (160) for selectively rotating at least one of the wheels (72,74),
said frame assembly (13) including a rear frame (14) and a pair of front frames (16) pivotally connected to the rear frame (14), a pair of said wheels (72) being mounted on the rear frame (14) and one of said wheels (74) being mounted on each of the front frames (16).

4,411,330

STAIR-CLIMBING APPARATUS FOR A WHEEL CHAIR OR SIMILAR MOBILE TRANSPORT MEANS

Adriaan Blokland, Breda, Netherlands, assignor to J. de Reus B.V., Netherlands

Filed Aug. 20, 1981, Ser. No. 294,541
Claims priority, application Netherlands, Aug. 21, 1980, 8004743
Int. Cl.³ A61G *5/04*
U.S. Cl. 180—8 A **4 Claims**



1. A stair-climbing apparatus for a wheel chair or the like mobile transport means, which apparatus is provided with an

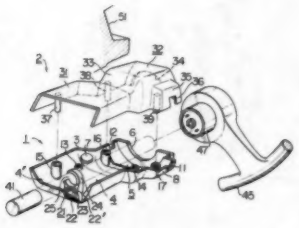
undercarriage, a plurality of pulleys mounted on the undercarriage, at least one endless track extending along a way defined by at least two of the pulleys, a drive mechanism for driving at least one of the pulleys and a frame for supporting the wheel chair or other mobile transport means, characterized in that the frame comprises a platform, means for adjusting the position of the platform relative to the undercarriage for maintaining the platform in a substantially horizontal position, the adjusting means comprising an elongated element including a counter-element member and a screwed spindle member receivable in the counter-element member and rotatable relative to the counter-element member to adjust the length of said elongated element, one of the members being pivotably connected to the undercarriage and the other of the members being pivotably connected to the platform, a motor for driving the screwed spindle member for varying the length of the elongated element, and means for controlling the drive mechanism to retard the drive mechanism in response to deviation of the platform from the horizontal.

4,411,331

AUTOMOTIVE STEERING COLUMN COVER

Hidekazu Hanada, Shizuoka, Japan, assignor to Nihon Plast Co., Ltd., Shizuoka, Japan

Filed May 19, 1981, Ser. No. 265,079
Claims priority, application Japan, May 21, 1980, 55-69904
Int. Cl.³ B62D *25/14*
U.S. Cl. 180—78 **9 Claims**



1. A steering column cover comprising an upper cover member defining therein a downwardly directed recess, a lower cover member defining therein an upwardly directed recess, said upper and lower cover members being assembled together so that the members abut each other along the edges of said recesses to form a generally hollow assembly having opposite ends defining therein openings for a steering shaft extending through said hollow assembly, at least said lower cover member being formed thereon with at least one integral clip extending radially inwardly to grip said steering column to mechanically connect said one cover member to said column, said clip being generally C-shaped and having an opening of a dimension which is slightly smaller than the diameter of said steering column so that the clip can be snapped onto said steering column by the resiliency of the material from which said lower cover member is made.

4,411,332

TILTCAB TRUCK WITH A SAFETY LATCH CYLINDER

Alexander V. Eichelsheim, Oldenzaal, Netherlands, assignor to Applied Power Inc., Milwaukee, Wis.

Filed Oct. 29, 1981, Ser. No. 316,369
Int. Cl.³ B62D *23/00*
U.S. Cl. 180—89.14 **15 Claims**

1. In a motor vehicle comprising:

(a) a chassis member;

(b) a cab member mounted on said chassis member for pivotal movement about an axis transverse to the longitudinal axis of said chassis member from a lowered first position to a raised second position;

(c) at least one tilt cylinder operatively connected to said chassis member and to said cab member to pivot said cab member back and forth between its first and second positions;

(d) a pump for supplying hydraulic fluid under pressure to said tilt cylinder;

(e) a reservoir for hydraulic fluid,

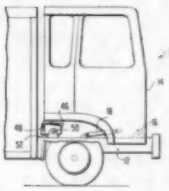
(f) a cab latch mechanism for latching said cab member to said chassis member when said cab member is in its first position; and

(g) first means for preventing extension of said tilt cylinder while said cab latch mechanism is latching said cab member to said chassis member,

the improvement wherein said first means comprises a combination hydraulic cylinder and safety valve in hydraulic series with said tilt cylinder, said combination hydraulic cylinder and safety valve comprising:

(h) a housing containing a longitudinal bore open at one end to the exterior of said housing;

(i) a longitudinal member slidably received in said longitudinal bore and projecting to the exterior of said housing, where it is operatively connected to said cab latch mechanism, said longitudinal member being movable between a retracted first position in which said cab latch mechanism is closed and a projecting second position in which said cab latch mechanism is open;



(j) a first path of fluid communication from said pump to a chamber in said longitudinal bore upstream of a reaction surface on said longitudinal member and from said pump to said tilt cylinder;

(k) a second path of fluid communication from said longitudinal bore downstream of said chamber, through said housing, and to said reservoir;

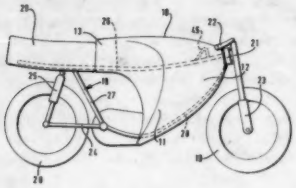
(l) a third path of fluid communication from said chamber, through said longitudinal member, and to the exterior of said longitudinal member at a point where it is in fluid communication with said second path of fluid communication when said longitudinal member is in its first position but is not in fluid communication with said second path of fluid communication when said longitudinal member is in its second position; and

(m) a one-way valve located in said third path of fluid communication, said one-way valve being oriented so that and having a rating such that it will open at a pressure less than the pressure required to extend said tilt cylinder, permitting hydraulic fluid to flow to said reservoir through said first, third, and second paths of fluid communication and preventing said tilt cylinder from extending if said longitudinal member is prevented from moving from its first position to its second position, opening said latch mechanism.

4,411,333
MOTOR CYCLE FAIRING

P. W. Bothwell, "Meoncote", 114 Shipston Rd., Stratford-upon-Avon, Warwickshire, England

Filed Nov. 13, 1981, Ser. No. 321,201
Claims priority, application United Kingdom, Nov. 15, 1980, 8036742
Int. Cl.³ B62D 23/00
U.S. Cl. 180—219 16 Claims

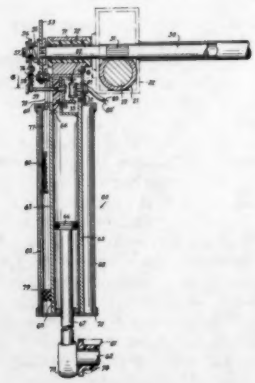


1. A motor cycle including a frame and a fairing mounted on the frame, the fairing comprising a body formed to provide a bridge portion having two depending side portions which define with the bridge portion a cavity of generally inverted U-shape in cross-section, a front portion extending upwardly and forwardly from the side portions and forwardly from the bridge portion, and a rear portion extending rearwardly from the bridge portion, the side portions being formed with rearwardly directed faces disposed in front of the positions to be occupied with a rider's legs and wherein the body comprises a shell filled with a relatively deformable material and completely enclosing the deformable material.

4,411,334
VEHICLE CONTROL SAFETY SYSTEM

Samuel L. Schlanger, Palm Springs, Calif., assignor to Gail B. Mauer, Beverly Hills, Calif. and Ellen R. Cohen, Wayne, N.J., a part interest

Filed Dec. 15, 1980, Ser. No. 216,419
The portion of the term of this patent subsequent to Mar. 13, 1996, has been disclaimed.
Int. Cl.³ B60R 1/18, 21/00
U.S. Cl. 180—274 17 Claims



1. A safety system for a vehicle having a chassis, including two parallel spaced-apart legs and an axle assembly for each of the wheels, comprising:

a suspension assembly including at least one air piston arrestor pivotably coupled between said chassis and one of said axle assemblies, including an inner cylindrical jacket having an upper and lower vent opening and a piston rod having a piston secured thereto at one end thereof which is slidably received in said jacket;

means for arresting said air piston arrestor in a relatively rigid, non-compressible state, including a pair of shutters, each of which is movable between an open and closed position relative to one of said vent openings

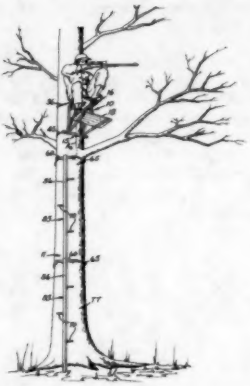
means for moving said shutters; and

electromechanical means for activating said arresting means.

4,411,335
HUNTER'S TREE STAND

Joseph H. Forrester, 3635 Thompson Mill Rd., Buford, Ga. 30518

Filed Mar. 26, 1981, Ser. No. 247,942
Int. Cl.³ A01M 31/02; A45F 3/26; A47C 9/10; E06C 1/10
U.S. Cl. 182—83 5 Claims



1. A hunting stand for supporting a hunter on a tree trunk comprising:

a frame having a stand axis, an upper end and a lower end, said frame including a pair of spaced apart back side members vertically oriented generally parallel to the stand axis; an upper cross member fixedly connecting the upper ends of said back side members and oriented generally normal to the stand axis; a lower cross member fixedly connecting the lower ends of said back side members and oriented generally normal to the stand axis; a pair of upper seat side members fixedly connected at one end to said upper cross member and projecting horizontally away from said upper cross member generally normal to said stand axis and said upper cross member; a pair of lower foot side members longer than said upper seat side members fixedly connected at one end to said lower cross member and projecting horizontally away from said lower cross member under said upper seat side members generally normal to said stand axis and said lower cross member; a pair of angular brace members fixedly connecting said back side members with said upper seat side members; and a pair of generally vertically extending strap members fixedly connecting the projecting end of each of said upper seat side members with each of said lower foot side members intermediate their ends;

a hunter support seat affixed to said pair of upper seat side members adjacent the projecting ends thereof to maintain the upper seat side members in the spaced apart position;

a planar hunter foot support affixed to said lower foot side members between said strap members and the projecting ends of said lower foot side members to maintain said lower foot side members in the spaced apart position;

a pair of tree penetrating support prongs affixed to said said upper cross member and projecting outwardly therefrom

oppositely to said upper seat side members and generally normal to but equidistant from and on opposite sides of the stand axis to engage the tree trunk;

a non-elastic elongate flexible securing member adjustably connected to said frame eccentrically of said support prongs while said securing member extends around the tree trunk to cause said support prongs to penetrate the tree trunk to fixedly yet removably locate said frame both longitudinally of and circumferentially about the tree trunk as the frame is pivoted from an initial tilted position in which the lower end of said frame opposite said support prongs is spaced away from the tree trunk to a final position in which the lower end of said frame opposite said support prongs lies adjacent the tree trunk so that the weight of the hunter on said foot support forces said frame from said initial position toward said final position;

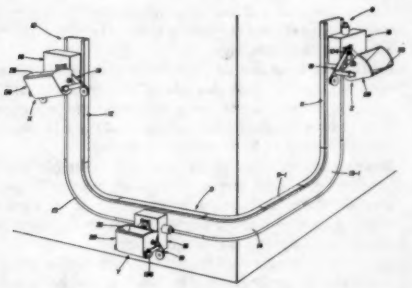
a pair of tree penetrating holding prongs affixed to said lower cross member equidistant from and on opposite sides of said stand axis and projecting from said cross member normal to said stand axis and in the same direction as said support prongs to engage the tree trunk when said frame is pivoted to its final position;

a non-elastic elongate, flexible holding member including length adjustment means adjustably connected to opposite ends of lower cross member for extension around the tree trunk so that said length adjustment means can be manipulated while the hunter is on said foot support to effectively shorten the length of said holding member and maintain said frame in said final position with said holding prongs in penetrating engagement with the tree trunk.

4,411,336
RAILWAY TRANSPORT BANKING SYSTEM

Walter G. Anders, North Canton, Ohio, assignor to Diebold Incorporated, Canton, Ohio

Filed Nov. 9, 1981, Ser. No. 319,441
Int. Cl.³ B61D *15/12*
U.S. Cl. 186—37 **37 Claims**

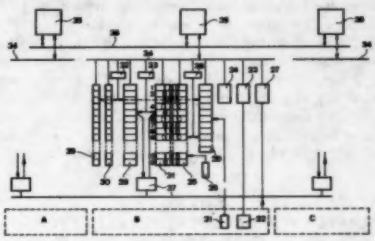


1. Banking service transport equipment for carrying out banking transactions between a teller station and a remote customer station, including a teller terminal, a customer terminal, and a self-propelled car transport mechanism connecting said teller and customer terminals of a type in which a car travels along a track system having horizontal and vertical track runs with curves between horizontal and vertical runs and a corner curve between horizontal run portions; a container; and multi-axis pivotal mechanism suspending the container from the car for pivotal movement on a first pivot axis at one of said teller and customer terminals and on a second pivot axis oriented at right angles to said first axis at the other of said terminals; said multi-axis mechanism having a cradle pivotally mounted on the car on a horizontally extending axis; and the container being pivotally mounted on the cradle on an axis spaced from and extending at right angles to the axis on which the cradle is pivoted; whereby the car, cradle and container form a car-cradle-container assembly that travels along the track system to and between said teller and customer terminals.

4,411,337
GROUP CONTROL FOR ELEVATORS

Joris Schröder, Lucerne; Hans Bosshard, Würenlos; Jiri Kinl; Miroslav Kostka, both of Ebikon, and Walter Zimmermann, Buochs, all of Switzerland, assignors to Inventio AG, Hergiswil, Switzerland

Continuation-in-part of Ser. No. 210,007, Nov. 24, 1980, Pat. No. 4,355,705. This application Jul. 9, 1981, Ser. No. 281,567
Claims priority, application Switzerland, Dec. 21, 1979, 11396/79
Int. Cl.³ B66B *1/18*
U.S. Cl. 187—29 R **9 Claims**



1. In a group control for elevators each having an elevator cabin and containing:

at least one storey call storage controllable by means of a storey call transmitter;

cabin call storages for controlling by means of cabin call transmitters each cabin of the group;

selectors operatively correlated with each elevator of the group indicating that storey at which the cabin still could stop;

load measuring devices operatively correlated with each elevator cabin;

a scanner device having at least one position for each storey;

each elevator being provided with a computer device possessing at least one adder which forms from at least the distance between a considered storey and the selector position, from the number of intermediate stops to be expected within such distance based upon the prevailing cabin and allocated storey calls and from the momentary cabin load, a time-proportional sum corresponding to the servicing capability of a cabin of the group with respect to the considered storey;

and

at least one comparison device by means of which the cabin having the lowest servicing costs corresponding to the smallest previously computated loss time and therefore the optimum servicing capability can be allocated to the considered storey;

the improvement which comprises:

each elevator being provided with a computer device for counting the number of allocated storey calls and one of a number of cabin calls between a selector position and the considered storey;

each elevator further being provided with a device which stores the momentary operating state of the elevator cabins;

the computer device being provided with a subtractor unit for forming a difference from the number of said allocated storey calls multiplied by a number of passengers expected to enter the elevator cabin and the number of cabin calls multiplied by a number of passengers expected to exit from the elevator cabin;

said difference and a momentary operating state of the eleva-

tor cabin being infeedable as a further summand to the adder of the computer device;

the scanner device being connected with the computer device which for each position of the scanner device forms the sum corresponding to the servicing costs of a cabin with respect to a real or imaginary storey call of such position;

a storage device connected with the computer device and the scanner device;

said storage device can be filled by means of said scanner device;

said storage device receiving the correlations of the momentarily most optimumly employable cabin having the lowest servicing costs for the relevant position of the scanner device;

said storage device containing the optimum correlations between the elevator cabin and scanner position contains for each elevator an allocation storage which can be filled during a revolution of the scanner device;

said allocation storage having inputs connected with said comparison device;

comparison of the servicing costs of the elevator cabins occurring at each scanner position; and

the elevator cabin exhibiting the lowest servicing costs having stored in the allocation storage an allocation instruction corresponding to the optimum correlation.

4,411,338

APPARATUS FOR CALCULATING ELEVATOR CAGE CALL FORECAST

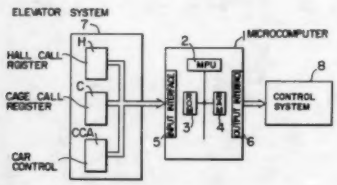
Soshiro Kuzunuki, Katsuta; Kotaro Hirasawa, Hitachi; Takeo Yuminaka, and Kanji Yoneda, both of Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Sep. 25, 1981, Ser. No. 305,713

Claims priority, application Japan, Sep. 27, 1980, 55-135022

Int. Cl.³ B66B *1/18*

U.S. Cl. 187—29 R **9 Claims**



1. An apparatus for calculating cage call foreast of an elevator car in an elevator system including cage call registering means disposed in said elevator car for specifying destination floors among a plurality of floors to be served by said elevator car, hall call registering means disposed at the elevator hall of each of said plurality of floors for calling said elevator car thereto, and means for operating said elevator car so that said elevator car can serve said plurality of floors in response to cage calls registered by said cage call registering means and hall calls registered by said hall call registering means, said apparatus comprising:

hall call counting means for counting the number of hall calls originated from a given one of said fllors;

cage call counting means for counting the number of cage calls, classified by destination floors, registered in the elevator car after the elevator car has served each of the hall calls originated from said given one floor; and

cage call origination probability calculating means for calculating the probabilities of origination of cage calls, classified by destination floors, which will be registered in said elevator car after said elevator car has subsequently served a new hall call which would be originated from said given one floor, on the basis of the number of the hall calls counted by said hall call counting means and the number of the cage calls, classified by destination floors, counted by said cage call counting means.

4,411,339

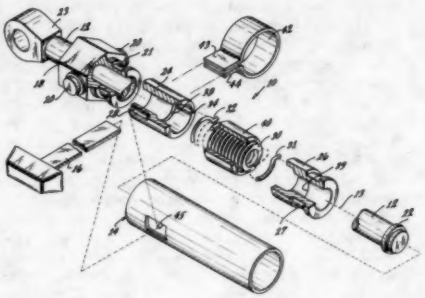
FRICTION LOCK MECHANISMS

Clyde R. Porter, Los Angeles, Calif., assignor to P. L. Porter Co., Woodland Hills, Calif.

Continuation of Ser. No. 157,458, Jun. 6, 1980, abandoned. This application Sep. 10, 1982, Ser. No. 416,637

Int. Cl.³ B65H *59/10*

U.S. Cl. 188—67 **2 Claims**



1. As an article of manufacture, an infinitely positionable mechanical friction lock comprising:

a housing having a non-rotatable rod positioned therein for axial movement in either direction with respect thereto;

a fixed bushing including an annular inclined cam surface at one end of said housing through which said rod extends;

a rotatable bushing including an inner annular inclined cam surface;

a single coil spring positioned on said rod and located between said bushings and normally operative to grip said rod to prevent axial movement thereof in either direction relative to said housing;

said fixed bushing and said rotatable bushing cooperating with said spring such that one of said bushings and the adjacent portion of the spring locks said rod in compression and the other of said bushings and the adjacent portion of the spring locks said rod in tension;

release means to effect rotation of said rotatable bushing whereby said coil spring is released from said rod by unwinding the coils of the spring adjacent the rotatable bushing to permit movement of the latter in either axial direction relative to said housing; and

means surrounding said spring such that as the spring is unwound to release said rod the slack of the spring will be transmitted to the end held by the fixed bushing rather than being accumulated in the turns nearest the rotatable bushing.

4,411,340

HYDRODYNAMIC BRAKES

Klaus Brosius, Heidenheim-Mergelstetten, and Berthold Herrmann, Heidenheim, both of Fed. Rep. of Germany, assignors to Voith Getriebe KG, Fed. Rep. of Germany

Continuation of Ser. No. 165,388, Jul. 3, 1980, abandoned. This application Oct. 21, 1982, Ser. No. 435,874

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1979, 2927582

Int. Cl.³ F16D *57/02*

U.S. Cl. 188—296 **3 Claims**

1. A hydrodynamic brake, comprising:

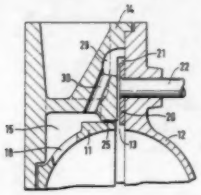
a casing;

a rotor bucket wheel;

a stator bucket wheel forming part of said casing;

said rotor bucket wheel and said stator bucket wheel cooperating to define a torus-shaped working chamber that can be filled with working fluid; said rotor bucket wheel and said stator bucket wheel further defining a bucket wheel gap between them; said casing having an outlet duct surrounding the outer circumference of and coaxial with said rotor bucket wheel; apertures connecting said working chamber and said outlet duct; said casing further including an annular, radially extending space coaxial with said bucket wheels and surrounding the perimeter of said bucket wheel gap; said radially extending space having a radially outermost, unobstructed, fluid containable region;

a plurality of baffle type flow obstruction means disposed in said radially extending space; said radially outermost region of said radially extending space being located radially outward of said flow obstruction means; said obstruction means being adapted to be moved into said bucket



wheel gap at least a portion of the time when the brake is not engaged and being movable out of said bucket wheel gap into said radially extending space when the brake is engaged;

said rotor bucket wheel having an external diameter, a portion of said rotor bucket wheel which defines said external diameter cooperating with said casing to form an annular, axially extending gap communicating between said bucket wheel gap and said outlet duct, and said axially extending gap being sufficiently narrow to define a flow controlling seal between said bucket wheel gap and said outlet duct; and

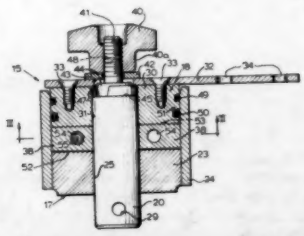
said casing further including a second open duct separate from said axially extending gap which connects said radially outermost region of said radially extending space to said outlet duct for venting to said outlet duct pressure in said radially outermost region of said radially extending space.

4,411,341

ROTARY HYDRAULIC DAMPER

John C. Schultz, Buffalo, N.Y., assignor to Houdaille Industries, Inc., Fort Lauderdale, Fla.

Filed Mar. 17, 1981, Ser. No. 244,808
Int. Cl.³ F16F 9/14; F16D 57/02
U.S. Cl. 188—310 **7 Claims**



1. In a rotary hydraulic damper adapted for connection to and between relatively moveable parts for damping the relative motion of said parts in at least one direction:

a stator structure having means for attachment to one of said parts;

a rotor structure having means for attachment to the other of said parts;

one of said structures being generally cup-shaped and provided with a tubular wall, and the other of said structures being telescopically assembled within said wall in relatively oscillatable and axially adjustable relation;

said stator structure having an axially inwardly facing surface provided with axially inwardly projecting integral radial vane means, and said rotor structure having an opposite axially inwardly facing surface directed toward and substantially axially spaced from said stator structure surface and provided with axially inwardly projecting integral radial vane means;

said surfaces defining with said tubular wall a damping fluid filled working chamber, and said vane means cooperating with one another in interdigitated relation for dividing said working chamber into subchambers which have axially opposite ends at said surfaces;

each of said vane means having an axially facing edge which is in restricted width damping orifice gap relation to the axially inwardly facing structure surface opposite to the surface from which the respective vane means extends, so that in relative rotation of said structures, said damping fluid will be displaced through the damping orifice gaps at each of said surfaces and each of said subchamber ends;

means for effecting axial adjustment of the entire stator structure and the entire rotor structure relative to one another for thereby adjusting the widths of said damping orifice gaps between each of said vane means edges and the confronting axially facing structure surface;

said means for effecting relative axial adjustment comprising an axially projecting pintle rigid with one of said structures and extending through said working chamber and relatively rotatably through the other of said structures and having a portion projecting beyond said other of said structures;

and a manually operable adjustment knob threaded on said projecting portion and thrusting toward said other of said structures;

so that by having the orifice gap widths substantially equal between each of said surfaces and said vane means edges, damping fluid displacement in substantially equally divided stable relation is adapted to be attained at both ends of said subchambers.

4,411,342

HYDRAULIC DAMPER

Teiji Katsumori; Tetuo Kato, and Miura Ieaki, all of Yokohama, Japan, assignors to Tokico Ltd., Kanagawa, Japan

Continuation of Ser. No. 124,238, Feb. 25, 1980, abandoned.
This application Jan. 27, 1982, Ser. No. 343,335
Claims priority, application Japan, Feb. 23, 1979, 54-20349
Int. Cl.³ F16F 9/36
U.S. Cl. 188—315 **6 Claims**

1. A hydraulic damper comprising:

a dual-tube type housing including inner and outer tubes defining therebetween a reservoir chamber;

a piston slidably mounted within said inner tube and dividing the interior thereof into first and second liquid chambers;

liquid filling said first and second liquid chambers and a portion of said reservoir chamber adjacent said second liquid chamber, and gas filling a portion of said reservoir chamber adjacent said first liquid chamber;

a piston rod secured to said piston and extending through said first liquid chamber to the exterior of said housing;

passage means for connecting said first liquid chamber to said gas filled portion of said reservoir chamber;

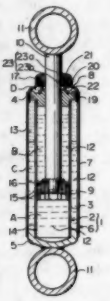
a seal member fixedly supported on said housing and sealing said first liquid chamber and said gas filled portion of said

reservoir chamber from the exterior, said piston rod sealingly slidably extending through said seal member;

a rod guide secured to said inner tube for guiding the sliding movement of said piston rod, said passage means including a clearance between said rod guide and said piston rod;

a cover secured to said outer tube and retaining said seal member;

means positioned in said passage means, for allowing fluid flow only from said first liquid chamber to said gas filled portion of said reservoir chamber and for preventing fluid flow in the reverse direction, said means comprising a resilient member having a flange portion, a base portion integral with said flange portion and extending axially therefrom, a lip portion integral with said base portion and extending axially therefrom, said lip portion coacting with a valve seat portion of said rod guide to form a one-way valve for controlling said fluid flow, and a cylindrical portion integral with said flange portion and extending generally axially therefrom at a location radially outwardly spaced from said base portion and said lip portion;



means for radially supporting and retaining said base portion and thereby for preventing excessive radial inward deformation of said lip portion due to pressure from said gas in said gas filled portion of said reservoir chamber, said supporting and retaining means comprising a first rigid annular retainer member including a generally radially extending flange portion positioned between an axially inner surface of said seal member and said flange portion of said resilient member, and an integral axially extending cylindrical portion having a radially outer peripheral surface in engagement with a radially inner peripheral surface of said base portion, and a second annular rigid retainer member including a generally radially extending flange portion abutting with an axially inner surface of said resilient member, and an integral axially extending cylindrical portion having a radially inner surface in engagement with a radially outer peripheral surface of said base portion; and

spring means acting between said rod guide and said second rigid annular retaining member for urging said resilient member and said first and second retainer members toward said inner surface of said seal member.

4,411,343

LUGGAGE TROLLEY

Khalil A. I. Cassimally, 403 Hayes Rd., Fort Pierce, Fla. 33450, and Horace Frommelt, Fort Pierce, Fla., assignors to Khalil Ahmid Ibrahim Cassimally, Fort Pierce, Fla.

Filed Sep. 14, 1981, Ser. No. 301,466

Int. Cl.³ B62B 1/12; A45C 5/14, 13/28

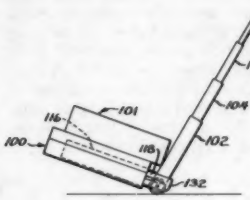
U.S. Cl. 190—18 A **31 Claims**

1. A portable case having top and bottom surfaces, two sides, a forward end, and a rear end defining an interior, and capable of being converted into a trolley, comprising:

first and second arm means, each having nesting first and second members, said first members being mounted on opposite sides of said case and each being capable of extending a forward end beyond the forward end of said case;

a handle extending between said second members;

means for mounting said second members for pivoting with respect to said first members when said second members are extended;



means for locking said second members at an angle greater than 30° to said first members;

wheel means; and

means for supporting said wheel means outside of said case near the forward end of said first members when said second members are pivoted and locked.

4,411,344

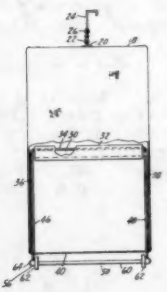
CARRIER FOR GARMENT BAGS AND THE LIKE

Brooks Walker, 1280 Columbus Ave., San Francisco, Calif. 94133

Continuation-in-part of Ser. No. 268,901, Jun. 1, 1981, and a continuation-in-part of Ser. No. 293,364, Aug. 17, 1981, Pat. No. 4,354,583, and a continuation-in-part of Ser. No. 310,636, Oct. 13, 1981. This application Jan. 18, 1982, Ser. No. 340,280

Int. Cl.³ A45C 5/14

U.S. Cl. 190—18 A **9 Claims**



1. In combination with a generally rectangular elongated garment bag adapted to be folded on itself along a transverse fold line, a carrier for said bag comprising:

a frame including a top transverse portion extending substantially along said fold line, and a pair of side members extending longitudinally of said bag and connected to said transverse portion,

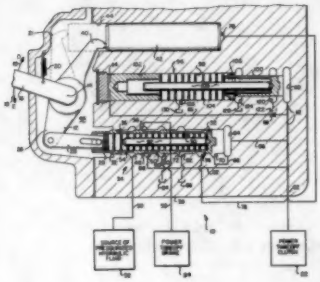
means securing said frame to said bag with said side members extending through the bottom of said bag, and

a wheeled axle extending between the projecting ends of said side members.

4,411,345
CLUTCH MODULATING SYSTEM

Robert E. Haight, Waterloo, and Kendall D. Tjepkes, Cedar Falls, both of Iowa, assignors to Deere & Company, Moline, Ill.

Filed Jan. 23, 1981, Ser. No. 227,730
Int. Cl.³ F16D *67/04, 25/00*; F15B *11/10*
U.S. Cl. 192—12 C 11 Claims



1. A system for modulating the application of fluid pressure to a clutch from a source of pressurized fluid comprising the combination of:

a source of pressurized fluid;

a first conduit coupled to a clutch;

a control;

means responsive to actuation of the control for coupling the source to the first conduit by a variable amount dependent on the position of the control;

a sump for pressurized fluid;

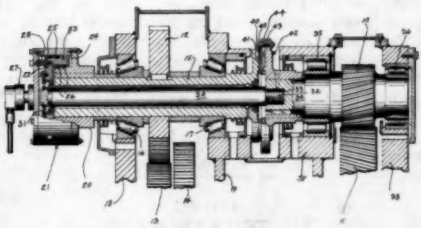
a second conduit coupled to the first conduit; and

means for coupling the second conduit to the sump to an extent directly related to the rate of pressure increase of fluid in the second conduit.

4,411,346
DISC CLUTCH APPARATUS

Ronald A. Witt, Milwaukee, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed Jun. 11, 1981, Ser. No. 272,537
Int. Cl.³ F16D *25/08*
U.S. Cl. 192—85 A 6 Claims



1. A disc clutch assembly, comprising:

a housing;

a driven clutch member journaled in and axially restrained in said housing, said driving clutch member having a clutch face;

a driven clutch member having a clutch face which confronts the clutch face of said driving clutch member, said driven clutch member being journaled in straight roller bearings the rollers of which are held in outer races mounted in said housing, said driven clutch member being free to slide relative to said rollers; and

means for axially shifting said driven clutch member toward and away from said driving clutch member, said shifting means including an axially restrained hydraulic cylinder and a piston operating within said cylinder and connected to said driven clutch member;

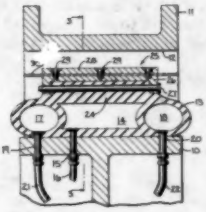
said driving clutch member and said hydraulic cylinder being mounted on opposite ends of a quill shaft which also mounts a driving gear, and

said piston is connected to one end of a rod that extends through the hollow interior of said quill shaft and is joined at its other end to said driven clutch member.

4,411,347
PNEUMATIC CLUTCH

Thomas R. Bednar, Milwaukee, Wis., assignor to The Falk Corporation, Milwaukee, Wis.

Filed Jul. 6, 1981, Ser. No. 280,318
Int. Cl.³ F16D *25/04, 19/00*
U.S. Cl. 192—88 P 11 Claims

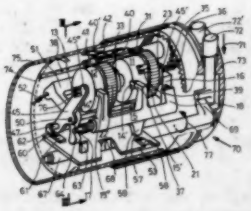


1. A flexible inflatable annular gland for a pneumatic clutch, said gland having walls of an elastomer material which define at least three hollow annular chambers arrayed across the width of the gland, a middle chamber bing larger than the two outside chambers, pneumatic fittings extending into the hollow interior of each chamber, and replaceable friction shoes mounted about the other perimeter of the gland.

4,411,348
CONTROL DEVICE FOR ELECTRIC MOTOR-REDUCING UNIT

Pierre Fillion, Ville la Grand, France, assignor to Somfy, Cluses, France

Filed Apr. 30, 1980, Ser. No. 145,326
Claims priority, application France, May 2, 1979, 79 11801
Int. Cl.³ F16D *71/00*
U.S. Cl. 192—139 10 Claims



1. A control device for an electric motor-reduction unit adapted to drive a winding tubular member of a rolling shutter, roller-blind or the like, comprising a plurality of cams disposed side-by-side on a common shaft on which they are freely rotatable, each of said cams having in its perimeter a single notch, means controlling a switch in the energizing circuit of the

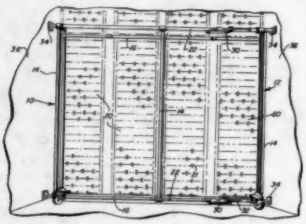
electric motor of said motor-reduction unit, said control means having cam-follower means engagable with the perimeters of said notched cams, means biasing said control means into engagement with said notched cams, a toothed wheel rigidly coupled with each of said notched cams and disposed laterally and coaxially relatively thereto, drive pinions on a pinion shaft parallel to the cam shaft and engageable with said toothed wheels respectively, said pinions being adapted to drive said toothed wheels at different speeds, and means for aligning at will the notches of said notched cams with said cam follower means of said control means, said aligning means comprising a heart-shaped cam rigid with each of said notched cams and means engageable with said heart-shaped cams to align notches of said notched cams with said cam follower means of said control means, and re-setting means for sequentially moving and holding said control means away from said notched cams, disengaging said toothed wheels from said drive pinions, and bringing said aligning means into engagement with said heart-shaped cams to align notches of said notched cams with said cam follower means of said control means.

4,411,349

CONVEYOR DEVICE USABLE AS BULKHEAD

Thomas R. Stedman, Elk Grove Village, and Ronald A. Voyda, Des Plaines, both of Ill., assignors to Walgreen Co., Deerfield, Ill.

Filed Jul. 6, 1981, Ser. No. 280,909
Int. Cl.³ B65G 67/00
U.S. Cl. 193—35 R **10 Claims**



1. A conveyor device usable also as a bulkhead in a storage compartment, which comprises: a frame, adjustable bar means carried by said frame to be pressed against the walls of said storage compartment to secure said frame as a bulkhead across a width of said storage compartment, at least one conveyor track member removably carried by said frame and having article conveyor means mounted thereon, said at least one track member and said article conveyor means forming at least one unit that is removable as a unit from said frame.

4,411,350

REVERSING CONVEYER TRACK

Frank Wolfram, 19986 Rollins Rd., Lake Villa, Ill. 60046

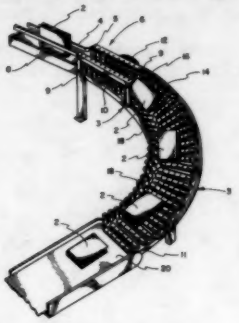
Filed Sep. 4, 1981, Ser. No. 299,392
Int. Cl.³ B65G 13/00
U.S. Cl. 193—35 A **15 Claims**

1. A reversing conveyer track for simultaneously changing the orientation, direction and spacing of books for use with book construction machinery, said reversing conveyer track comprising:

means for accepting the books attached to one of the book construction machines;

variable means for establishing a predetermined spacing of the books and for outputting the books from said means for accepting with a predetermined velocity, said variable means attached to said means for accepting and in momentary contact with the books;

means for orienting and directing the books attached to said means for accepting the books, said orienting of the books being a change from an edge position to a side position and said direction of said books being a direction of movement



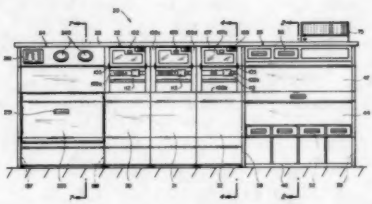
different from the input movement direction of books to the means for accepting the books.

4,411,351

BOTTLE DISPENSING AND CONTROL SYSTEM

Marlene Lowder, 3414 San Pablo, San Jose, Calif. 95127, and Norman B. Johnson, San Jose, Calif., assignors to Marlene Lowder, San Jose, Calif.

Filed Oct. 3, 1980, Ser. No. 193,471
Int. Cl.³ G07F 7/06
U.S. Cl. 194—4 C **3 Claims**



3. In combination, a bottle dispensing mechanism, adapted to store bottles of selected classifications, bottle disposal apparatus adjacent said dispensing mechanism, a receptacle in said disposal apparatus adapted to receive discarded bottles, a movably-mounted gate in said disposal apparatus controlling access to said receptacle, and control means for identifying a bottle of one of the selected classifications when the bottle is placed in said disposal apparatus and moving said gate to open position to provide access to said receptacle, said disposal apparatus including a guide chute above said gate and arranged to direct a bottle to a position partially supported by said gate whereby when said gate is moved to open position the bottle drops into said receptacle.

4,411,352

RACETRACK ESCALATOR

John L. Kettle, Vernon, Conn., assignor to Otis Elevator Company, Farmington, Conn.

Filed Apr. 15, 1981, Ser. No. 254,360
Int. Cl.³ B66B 9/12
U.S. Cl. 198—328 **2 Claims**

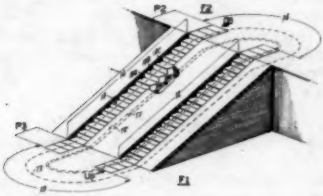
1. An escalator comprising a plurality of interconnected stairs which are propelled upon tracks by drive means, for transporting passengers between two floors, characterized in that:

the stairs are propelled between two floors in a closed loop racetrack-like pattern having an inner perimeter and an

outer perimeter, a plurality of the stairs form moving staircase sections in the pattern for carrying passengers up and down between floors, the stairs pass underneath the floor when changing between those staircase sections and the stairs are substantially level with the floors just before and after passing underneath them;

a biaxis linkage couples each stair to its adjacent stair and is adapted to permit each stair to rotate and elevate relative to adjacent stairs along said inner perimeter about an axis located along the inner perimeter of the pattern and substantially normal to the horizontal direction of stair movement in the pattern, said linkage comprising a hinge bar and a pivot post; the pivot post is attached to the edge of each adjacent step joined by said coupling means, and extends in the direction of said axis which is substantially normal to the horizontal direction of stair movement, and the hinge bar is disposed to rotate on the post and also slide lengthwise along it;

at least three tracks support the stairs, two of these tracks



follow the inner perimeter of the pattern and are inclined relative to the floors and vertically displaced relative to each other between floors to elevate adjacent stairs and are positioned at the floors to be substantially coplanar to the floors, and the third track follows the outer perimeter of the pattern and is positioned relative to the other two tracks;

each stair includes a first flat roller that rides on the third track and a pair of rollers, each roller riding on one of the other two tracks and registering with it;

the first flat roller is connected to one of the other rollers to provide a differential turning force as the stair moves around a curve in the pattern; and

the first flat roller is rotationally coupled to one of the other two rollers, and has, axially disposed relative to each other, a first diameter portion for curved sections of the pattern, and a second portion with a smaller diameter substantially the same diameter as the roller to which the flat roller is coupled, for straight track sections of the pattern.

4,411,353

GLASSWARE TRANSFER

Lawrence K. McDole, Brockway, Pa., assignor to Brockway Glass Co., Inc., Brockway, Pa.

Filed Feb. 10, 1981, Ser. No. 233,164

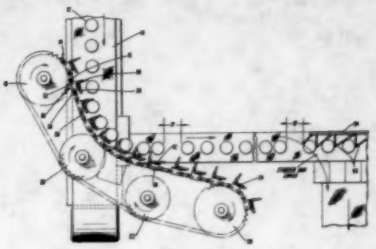
Int. Cl.³ B65G *47/26*

U.S. Cl. 198—425 **9 Claims**

1. Apparatus for transferring a series of generally equally spaced articles from a first conveyor onto a second conveyor oriented generally perpendicularly to the first conveyor, comprising:

endless carrier means for urging said articles from said first conveyor onto said second conveyor, said endless carrier means including a plurality of equally spaced pusher members, said endless carrier means also including at least two pusher members spaced apart a predetermined distance which is greater than the spacing of said equally spaced pusher members such that two of the generally equally spaced articles are adapted to be arranged on said second conveyor spaced apart a distance which is greater than the spacing of the remaining articles on the second conveyor after transfer; and

said at least two pusher members spaced apart the predetermined distance greater than the spacing of said equally spaced



pusher members defining a leading pusher member and a trailing pusher member, said leading pusher member being spaced apart from an adjacent one of said equally spaced pusher members by a predetermined distance which is less than the spacing of said equally spaced pusher members.

4,411,354

TRANSPORT INSTALLATION FOR MANUFACTURED PRODUCTS, PARTICULARLY ELEMENTS OF AUTOMOBILE BODIES

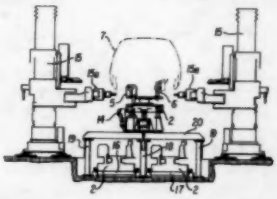
Bernard Thibault, Boulogne Billancourt, and Andre Le Goff, Neauphle-le-Chateau, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Nov. 17, 1980, Ser. No. 207,473

Claims priority, application France, Dec. 6, 1979, 79 29990; Nov. 3, 1980, 80 23450

Int. Cl.³ B65G *37/00*

U.S. Cl. 198—472 **5 Claims**



1. A robot automated assembly line for automobile body elements, comprising:

at least two types of mounting supports for said body elements;

an upper advance line holding a plurality of said mounting supports, wherein said body elements are acted upon by robots;

means for advancing said mounting supports along said upper advance line; and

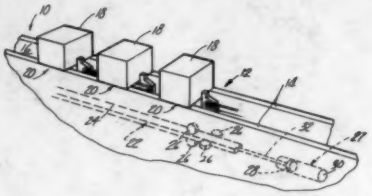
a lower return line extending beneath said upper advance line for accumulating and storing said mounting supports, said return line including at least two parallel side-by-side tracks, each of said tracks being separated by a longitudinal series of central supports, said return line being laterally defined by a longitudinal series of columns, said columns defining supports for the upper advance line, said columns providing a wide foundation for supporting said upper advance line and providing said upper advance line with clearance for the arms of said robots;

wherein said each said return tracks being adapted for returning a selected type of said mounting supports.

4,411,355
AUTOMATIC ACCUMULATING TRANSFER MECHANISM

James L. Furlette, and Donald A. Stadler, both of Fenton, Mich., assignors to Excel Corporation, Fenton, Mich.

Filed Nov. 8, 1978, Ser. No. 959,030
Int. Cl.³ B65G 25/10
U.S. Cl. 198—718 9 Claims



1. A mechanical automatic accumulating transfer mechanism comprising:

a frame, said frame comprising a pair of spaced and substantially parallel support rails upon which a series of workpieces can be slidably mounted, said workpiece being positioned at work stations defined along the support rails at spaced intervals;

a shuttle assembly reciprocably mounted with respect to said frame;

a plurality of pusher dogs mounted to said shuttle assembly wherein one pusher dog is associated with each work station;

means for longitudinally reciprocally moving said shuttle assembly with respect to said frame and thus said pusher dogs in unison with each other from their respective associated work station and to the next forward work station, said movement of said shuttle assembly being in a forward and in a rearward direction,

means pivotally mounting said pusher dogs to said shuttle assembly and being pivotal between an upper, workpiece engaging position and a lower, workpiece clearing position;

knockdown means for pivoting said pusher dogs to their lower position;

means for detecting the absence of a workpiece at a station;

means responsive to said detecting means for actuating the pusher dog associated with the vacant work station from the lower to the upper workpiece engaging position and for pivoting all pusher dogs rearwardly of said vacant work station from their lower to their upper, workpiece, engaging position, said last mentioned means being operable upon movement of said shuttle assembly in a rearward direction.

4,411,356
DEVICE FOR TRANSPORTING PRINTING PLATES

Adolf Radas, Frankfurt, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

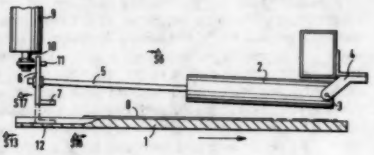
Filed Sep. 1, 1981, Ser. No. 298,287
Claims priority, application Fed. Rep. of Germany, Sep. 8, 1980, 3033759
Int. Cl.³ B65G 25/00
U.S. Cl. 198—721 7 Claims

1. A device for transporting printing plates in a processing unit, in which the printing plates are brought from a starting position into a final position on a processing table, comprising:

a pneumatically operated, swiveling first actuator located above the plane in which the printing plate rests in its starting position on the processing table, said first actuator having an actuating rod capable of extension and retraction in the longitudinal direction of the processing unit;

at least one pusher-element attached to said actuating rod for transporting the printing plate from the starting position into the final position when said first actuator is operated;

means for raising said pusher-element from a level beneath the transport plane of the printing plate to a level above the transport plane of the printing plate and for lowering the said pusher-element in the opposite sense;



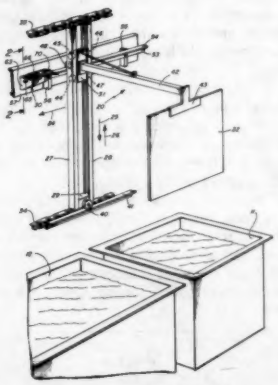
a front plate fastened to said actuation rod, said front plate carrying said pusher elements on both lateral sides and having an opening into which said means for raising and lowering the pusher rod engages; and

a switch operated by one end of the printing plate when the final position is reached for initiating the reversal of the movement of said actuating rod.

4,411,357
SAFETY DEVICE FOR USE IN CONVEYOR-TYPE APPARATUS

Samuel N. Caddell, Stoughton, Mass., assignor to Systems Engineering and Manufacturing Corp., Stoughton, Mass.

Filed Oct. 10, 1980, Ser. No. 196,038
Int. Cl.³ B65G 17/00
U.S. Cl. 198—802 6 Claims



1. A multistation work processing conveyor apparatus comprising,

a carrier arm assembly mounted for movement along a horizontal path and having a vertically movable slide arm therein,

an elevator for moving said slide arm vertically in an up or down direction,

means for advancing the carrier arm assembly horizontally along a defined path of travel through a plurality of work locations, each location corresponding to a work station having a sufficient area to accommodate at least one carrier at a time,

means for positively holding the slide arm in a predetermined vertical location along said horizontal path and comprising a guide rail defining a support surface,

a flipper plate mounted on said elevator and defining a portion of said guide rail surface for moving into an open

second position out of contact with said slide arm allowing generally relative vertical movement of said slide arm with respect to said elevator when in said second position and supporting said slide arm and preventing unwanted movement in a downward direction when in a first position with said first position of said flipper plate further permitting vertical movement of said slide arm with said slide arm supported by said flipper plate,

and a safety means comprising a portion of said flipper plate and having a cam surface for responding to direct contact with a portion of said carrier arm assembly and for positively positioning said plate in said first position by mechanical contact action.

4,411,358

PACKAGE

Percy Bennwik, Saltsjö-Boo, and Birger Hjertman, Vällingby, both of Sweden, assignors to Vitrum AB, Stockholm, Sweden

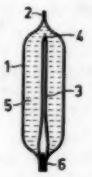
PCT No. PCT/SE81/00110, § 371 Date Dec. 7, 1981, § 102(e) Date Dec. 7, 1981, PCT Pub. No. WO81/02876, PCT Pub. Date Oct. 15, 1981

PCT Filed Apr. 9, 1981, Ser. No. 329,275

Claims priority, application Sweden, Apr. 10, 1980, 8002709

Int. Cl.³ B65D *25/00*

U.S. Cl. 206—45.34 **9 Claims**



1. A package for protection of a product packed therein against the influence of light and/or gases but making possible a visual control of the contents of the package before said package is opened, characterized in that it comprises a light-proof outer bag and a light-permeable inner bag arranged inside the outer bag, the outer and inner bags each being sealed at one of their ends, and being bonded to each other around their periphery close to their other end and furthermore at the same end, at or beyond the peripheral bonding, viewed from the sealed ends, being connected so that the inner and outer bags are sealed in common, the contents of the package being arranged between the outer bag and the inner bag, such that after removal or opening of the common seal, the inner bag can be turned out of the outer bag at the same time as it is turned inside out, and the contents of the package in this way can be visually observed through the wall of the inner bag.

4,411,359

FLUID POUCH WITH INTEGRAL STRAW

Gino Franco, Canoga Park, Calif., assignor to Magna Technologies, Inc., Woodland Hills, Calif.

Filed Jun. 18, 1981, Ser. No. 274,877

Int. Cl.³ B65D *77/28*

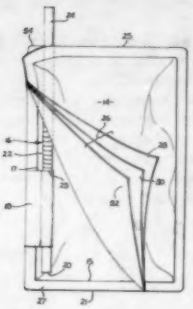
U.S. Cl. 206—217 **2 Claims**

1. A pouch with an integral drinking straw comprising:

at least two sheets of laminated plastic sealed together along their perimeter;

an integrally formed unitary drinking straw and mounting flange, said mounting flange being secured along said sealed perimeter such that the drinking end of said straw that aligns with an intended opening in said pouch and such the fluid drawing end of said straw is maintained at least some distance away from the perimeter and walls of said pouch;

said unitary drinking straw having an integral longitudinally expandable and heat-contractable bellows section, said drinking straw being maintained within said pouch with said bellows section in compression;



whereby said drinking straw may be heat contracted into position during manufacture of said pouch and whereby said drinking straw will alignably expand toward and through said intended opening when said pouch is opened.

4,411,360

STORAGE AND RECORD SYSTEM FOR A LARGE NUMBER OF ASSOCIATED IMAGES

Bayard G. Gardineer, Jr., Skillman, and Charles W. Howlett, Plainfield, both of N.J., assignors to Technicare Corporation, Solon, Ohio

Continuation of Ser. No. 87,849, Oct. 24, 1979. This application May 21, 1981, Ser. No. 265,888

Int. Cl.³ B65D *85/30, 85/57*

U.S. Cl. 206—313 **1 Claim**

1. A system for recording and preserving a plurality of sequentially associated images comprising:

a. a disc having a center of rotation and consisting of photographic film for at least a portion of an annulus having its outer circumference at a predetermined radius from said center;

b. first envelope means having an opening on one side, designated "bottom", to accommodate free passage of said disc, said first envelope means being adapted to carry said disc in freely removable, positionally certain relationship adjacent said opening, said first envelope means defining a recess on said one side along said opening, to facilitate removal of said disc;

c. second envelope means having an opening on one side, designated "top", for receiving said first envelope means in inverted nested relationship therein, with said bottom side of said first envelope means being located generally opposite said top side of said second envelope means, for

optional retention of said disc within said second envelope means upon at least partial withdrawal of said first envelope means, said second envelope means defining a first void therein corresponding to said center of said disc, and a second void located said radius outwardly from said first void;

d. wherein said second envelope means further defines a recess along said top opening to facilitate withdrawal of said first envelope means;

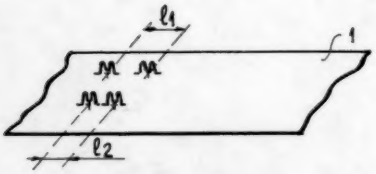
e. and further comprising means associated with said first and second envelope means, for limiting the travel or withdrawal of said first means from said second means, but permitting exposure of said film portion of said disc through said second void as said disc is retained in said second envelope means.

4,411,361

SUPPORTING STRIP FOR CAPACITOR CONNECTIONS, STRIP PROVIDED WITH SUCH CONNECTIONS AND ITS USE FOR THE PRODUCTION OF CAPACITORS

Regis Mentzer, Bagnolet, France, assignor to L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques, Bagnolet, France

Filed May 4, 1982, Ser. No. 374,897
Claims priority, application France, May 8, 1981, 81 09230
Int. Cl.³ B65D 73/02
U.S. Cl. 206—329 19 Claims



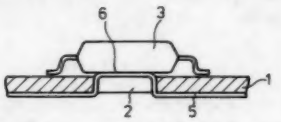
1. A supporting strip to aid in the production of electrical components of the type having a hairpin connector having terminal ends between which the electrical component is grippingly engaged during production thereof, said supporting strip comprising a support member including means defining plural paired upper and lower openings each for receiving a respective one of said hairpin connectors therein in such a manner that said terminal ends are disposed beside their respective lower openings, said paired openings being longitudinally spaced apart relative to adjacent ones thereof along said support member, each of said upper openings including means defining first opposing edge surfaces separated from one another by a first predetermined dimension, and each of said lower openings including means defining second opposing edge surfaces separated from one another by a second predetermined dimension less than said first dimension, said first and second edge surface defining means for convergingly displacing said terminal ends relative to one another as said hairpin connector is advanced through its respective paired upper and lower openings in a direction of movement from said upper opening to said lower opening to increase the gripping engagement exerted by said terminal ends upon said electrical component.

4,411,362

ASSEMBLY DEVICES FOR ELECTRONIC CIRCUIT COMPONENTS

Eiji Itemadasi, Sakai; Kazuhiro Mori, Katano; Sohei Tanaka, Neyagawa, and Akira Kabeshita, Moriguchi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Aug. 4, 1982, Ser. No. 405,105
Claims priority, application Japan, Aug. 11, 1981, 56-125654
Int. Cl.³ B65D 73/02, 75/22
U.S. Cl. 206—330 8 Claims



1. An assembly device for electronic small components comprising:

a first belt-like long object having a first face and a second face, and provided with a plurality of openings at predetermined intervals, and

a second belt-like long object disposed on said second face of said first belt-like long object,

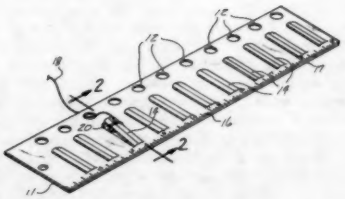
portions of said second belt-like long object at said plurality of openings having adhesive faces which project above the plane of said first face by at least a predetermined height for attaching electronic chip components at said openings.

4,411,363

HOLDER FOR SKEINS OF EMBROIDERY FLOSS

Lois J. Walker, 6708 Blue Spruce Ct., Union Lake, Mich. 48085

Continuation of Ser. No. 159,058, Jun. 13, 1980, abandoned.
This application Aug. 23, 1982, Ser. No. 410,425
Int. Cl.³ B65D 85/00
U.S. Cl. 206—388 5 Claims



1. A holder for a skein of embroidery floss comprising:

(a) a planar member,

(b) an aperture formed in the planar member for receiving a color-coded end of a skein of a floss, the color-coded end being projectable through the aperture; and

(c) means for removably retaining the color-coded end of a skein of floss after being projected through the aperture, the retaining means being formed in the planar member and juxtaposed the aperture, the retaining means including:

a planar tab formed in the planar member, the tab having a base end integrally formed with the planar member and a free end limitedly rotatable about the longitudinal axis of the planar member for receiving the color-coded end of the skein of floss thereon such that the planar tab removably pinching pinches the color-coded end of skein of floss between itself and the planar member when disposed in the plane of the planar member.

4,411,364
SKIN-PACKAGED POUCHES OF THE RETORT OR LIKE TYPE

Davide R. Friedman, Hanover Park, Ill., assignor to Stone Container Corporation, Chicago, Ill.

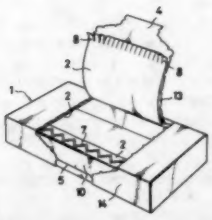
Filed Jan. 19, 1982, Ser. No. 340,802
Int. Cl.³ B65D 73/00
U.S. Cl. 206—466 7 Claims

1. A skin package comprising, in combination, a paperboard substrate member capable of permitting passage of air therethrough from opposite surfaces thereof, said member having a medial body portion and marginal edges spaced from said body portion, a product-laden retort or like pouch supported on said medial body portion inwardly of said marginal edges, said pouch formed of a pair of rectilinear sheets of fragile, flexible material thermally sealed together along the perimetric edges othereof, said product capable of generating hydraulic, wave-like forces impinging against said sealed edges internally of the pouch during handling of the package which are capable of rupturing said sealed edges, a plastic film means vacuum-drawn and laminated on said substrate tightly engaged over said pouch and said sealed edges for mounting and immobilizing said pouch on said medial portion, for reinforcing and pressing said sealed edges against said substrate member to prevent rupture of said sealed edges by internal generated forces, and for reducing the effect of such forces against interior surfaces of the pouch sufficient to prevent flex-cracking of the sheets, said member having planar portions extending beyond said sealed edges to provide stacking strength for the package when oriented vertically in a shipping carton.

4,411,365
MOISTURE PROOF CONTAINER WITH AN OUTER BOX AND AN INNER BAG OPENED SIMULTANEOUSLY

Hisao Horikawa, Funabashi, and Mitsuru Kano, Tokyo, both of Japan, assignors to Toppan Printing Co., Ltd., Japan

Continuation of Ser. No. 65,178, Aug. 9, 1979, abandoned. This application Jan. 18, 1982, Ser. No. 340,457
Claims priority, application Japan, Aug. 17, 1978, 53-112800; Oct. 11, 1978, 53-139485
Int. Cl.³ B65D 5/54, 5/56
U.S. Cl. 206—607 8 Claims



1. A moisture proof container comprising:

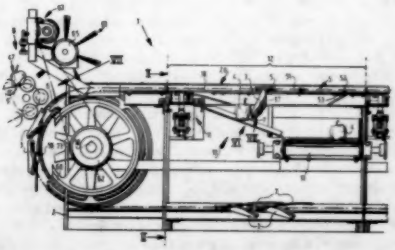
an outer closed box formed from a blank of box material, said outer box having a wall section comprised of first and second overlapping panel sections of said blank of box material, said first panel section overlapping said second panel section on the outside of said second panel section, said outer box having a pair of spaced tear away lines through a portion thereof which includes said first panel section to define an openable panel portion;

a substantially closed inner bag within said outer box, said inner bag formed from a blank of moisture proof uniaxially oriented sheet material having a uniaxial orientation extending in a first direction, said sheet material having a first portion and a second portion, said first portion of said sheet material prior to formation of said inner bag being spaced along said sheet material in said first direction from said second portion of said sheet material, and said sheet material being arranged to form said inner bag in a manner such that said first portion overlaps and is releasably adhered by releasable adhesive means to said second portion to define an adhered section of said inner bag, said adhered section extending in a second direction which is at right angles to said first direction of said sheet material, said substantially closed inner bag being adhesively secured within said outer box with at least a part of said sheet material adjacent to said first portion adhesively secured to said openable panel portion of said outer box, said substantially closed inner bag being secured within said outer box in a manner (i) such that the orientation of the direction of overlap of said first portion with respect to said second portion of said sheet material forming said inner bag coincides with the direction of overlap of said first panel section with respect to said second panel section of said outer box, (ii) such that said adhered section of said inner bag crosses at right angles to said spaced tear away lines of said outer box, and (iii) such that said adhesively secured part of said sheet material adjacent to said first portion is non-releasable from said openable panel portion relative to said releasably adhered first and second portions of said sheet material, and said first portion being releasably adhered to said second portion and said inner bag being adhesively secured within said outer box such that when said openable panel portion is opened by tearing along said tear away lines, said first portion between said tear away lines is released and separates from said second portion of said sheet material to thereby move with said openable panel portion with said second portion remaining in position in said outer box, whereby said inner bag is opened simultaneously with said openable panel portion.

4,411,366
DEVICE FOR GRADING PRODUCTS

Jan A. De Greef, Tricht, Netherlands, assignor to De Greef's Wagen-, Carrosserie- en Machinebouw B.V., Tricht, Netherlands

Filed Mar. 23, 1981, Ser. No. 246,906
Claims priority, application Netherlands, Mar. 31, 1980, 8001900
Int. Cl.³ B07C 5/24
U.S. Cl. 209—648 19 Claims



19. In a machine for conveying discrete objects and discharging them to a selected station, of the type having an endless conveyor means for receiving the discrete objects and traveling them along a horizontal path which overlies a plural-

ity of discharge stations, said endless conveyor means comprising a series of receptacles pivotally connected at their forward ends to allow their trailing ends to swing downwardly to discharge position at a selected one of said discharge stations, the improvement which comprises:

a downwardly inclined slide underlying said path at an upstream position relative to and leading to each discharge station;

each discharge station presenting a support disposed a predetermined distance below said path; and

means for controlling downward tilting of each receptacle to gently discharge an object and cushion it on a slide and for thereafter controlling the progress of the cushioned object down the slide generally in accord with continued movement of the receptacle until an object reaches and is deposited gently on the support of the discharge station, said means comprising a flexible strip which moves with each receptacle in trailing relation thereto and which is of a length to reach the support when its associated receptacle is above such support.

4,411,367

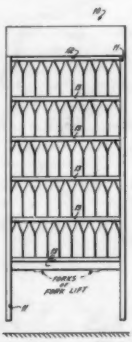
MOBILE DISPLAY RACK

Rafael T. Bustos, Atlanta, Ga., assignor to Leggett & Platt, Incorporated, Carthage, Mo.

Filed Jul. 27, 1981, Ser. No. 287,437

Int. Cl.³ A47F 7/28

U.S. Cl. 211—187 **5 Claims**



1. A mobile display rack for transporting and displaying packaged products which comprises: a frame structure of rectangular configuration comprising four vertically disposed support members; a stationary shelf fixedly supported by the support members at or near their tops; a plurality of slideably adjustable, non-fixedly supported shelves positioned one above the other but below the stationary shelf; means including said four vertically disposed support members for supporting said slideably adjustable shelves for slideable vertical adjustment relative to said four vertically disposed support members; and a shelf stop assembly on which each slideably adjustable shelf rests in its lowest vertically adjusted position; said adjustable shelves being adapted to display product containers and when so used to freely move upwardly when a continuing lifting force is applied to the lowest movable shelf whereby the product containers on the lowest movable shelf will contact the bottom of the next highest movable shelf causing that movable shelf to move upwardly so that its containers contact the bottom of the next highest shelf, and so on, until the containers on the uppermost slideable shelf contact the bottom of the stationary shelf thereby compressing all of the containers immovably between the stationary shelf and the lowest slideable shelf.

5. A process for rendering immovable the containers displayed on a plurality of vertically movable shelves positioned one above the other beneath a stationary shelf thereby rendering the displayed containers transportable, which comprises: applying a lifting force to the bottom of the lowest movable shelf thereby raising it so that the containers displayed thereon contact the bottom of the shelf immediately above it, said latter shelf thereby being raised so that the containers displayed on it contact the bottom of the shelf immediately above it, said latter shelf thereby being raised, and so on, until the containers displayed on the uppermost movable shelf contact the bottom of the stationary shelf, whereby all of the containers are placed under a compressive force rendering them immovable on their respective shelves.

4,411,368

SAFETY SYSTEM FOR HYDRAULICALLY CONTROLLED HOISTING APPARATUS

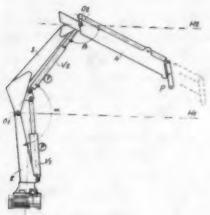
Roger Manjot, La Jonquiere de Maupas, Marennes (Rhone), France

Filed Mar. 9, 1981, Ser. No. 241,664

Claims priority, application France, Mar. 21, 1980, 80 07238; Jun. 6, 1980, 80 13018

Int. Cl.³ B66C 13/48

U.S. Cl. 212—149 **4 Claims**



1. In a crane system comprising:

a hydraulically operated crane having:

a support,

a first arm extending upwardly from said support,

a second arm pivotally connected to said first arm at an upper end thereof,

a first piston-and-cylinder arrangement hingedly connected to said first and second arms for varying an angle between them,

a third arm pivotally connected to said second arm,

a second piston-and-cylinder arrangement pivotally connected to said second and third arms for varying an angle between them, and

a telescoping member on said third arm, extensible therefrom and adapted to support a load, said member being provided with hydraulic means for extending and retracting said member;

distributor valve means connected to said first and second piston-and-cylinder arrangements and to said hydraulic means for controlling the relative movements of said arms and said member to prevent overloading of the crane by limiting certain relative movements while permitting others, said distributor valve means including at least one distributor valve having a linearly shifting valve member; and

circuit means including detectors establishing first and second pressure thresholds for said piston-and-cylinder arrangements for controlling said distributor valve means to establish the conditions under which said first and second piston-and-cylinder arrangements and said hydraulic means can be actuated after said thresholds are exceeded, the improvement which comprises:

means responsive to said detectors for shifting said valve member from either of two selected positions to either side of a central position, into said central position, said shifting means comprising:

a pair of stops formed in axially spaced relationship on said member,

at least one actuator surrounding said member between said stops whereby said member can move relative to said actuator while said actuator is immobilized against one of said stops, and

means for energizing said actuator to displace said actuator and thereby shift said member toward said neutral position.

4,411,369

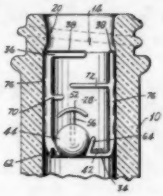
ONE WAY STOPPER PLUG FOR BOTTLES

Allan A. Borows, 1889 Palmer Ave., Larchmont, N.Y. 10538

Filed May 25, 1982, Ser. No. 381,823

Int. Cl.³ B65D *49/02*

U.S. Cl. 215—21 **9 Claims**



1. A one-way stopper plug for bottles and the like, to permit pouring out of the liquid content of a bottle while preventing refilling of the bottle, comprising in combination:

(a) a one-piece, resilient plastic molding comprising mating halves joined to each other by an integral living hinge,

(b) each half being constituted of a semi-cylindrical wall having at its ends two transverse walls, all walls being integral,

(c) said semi-cylindrical wall and transverse walls of each said one half having planar edge portions lying in a flat plane and being adapted for engagement with corresponding edge portions of the other half, thereby to form a complete cylinder,

(d) said living hinge connecting together the planar edge portions of two of the said integral walls, one from each of said halves,

(e) said mating halves providing a channel therethrough when they form a complete cylinder, and

(f) back-check valve means including portions of said halves, operable to limit flow of liquid through said channel in one direction.

4,411,370

OPENING ARRANGEMENT FOR CANS

Hans Rausing, Lund, Sweden, assignor to Tetra Pak Developpement SA, Pully, Switzerland

Filed Jun. 17, 1982, Ser. No. 389,496

Claims priority, application Sweden, Jun. 18, 1981, 8103849

Int. Cl.³ B65D *17/34*

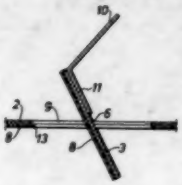
U.S. Cl. 220—269 **12 Claims**

3. An opening arrangement for packing containers having at least one plane end wall made of sheet steel, comprising:

a first U-shaped tongue punched through the end wall;

a second U-shaped tongue punched through the end wall and located adjacent said first tongue, each tongue having a straight base line defined between end points of said respective U-shaped tongue, said base lines paralleling each other and defining between them a relatively narrow intermediate portion of the end wall, both of said tongues and said intermediate portion being pivotable in unison with respect to the end wall around end portions of said intermediate portion; and

a cover strip fixed to the inner surface of the end wall and covering said intermediate strip and said tongues to seal



said intermediate strip and said tongues before they are pivoted to open the container.

4,411,371

HATCH COVER LOCKING MECHANISM

Lyn D. Collier, 7310 Woodland West Dr., Houston, Tex. 77040, and Marvin Stark, 727 Wax Myrtle, Houston, Tex. 77079

Filed Nov. 10, 1980, Ser. No. 205,173

Int. Cl.³ B65D *45/20, 45/28*

U.S. Cl. 220—314 **5 Claims**

1. A locking mechanism for hatch covers used on covered hopper cars, the improvement comprising:

a hatch cover movable between an open and a closed position about a hatch opening;

a carrier bar having means attached to the hatch cover;

hinge means located at one end of the carrier bar;

a latch;

means securely mounting the latch to the hopper car;

a locking strip comprising a flexible member having one end attached to the carrier bar for pivotal movement of the strip and having a free end, said locking strip having a locking portion engageable with the latch;

grasping means attached to the flexible member for lifting the free end and moving the flexible member into and from engagement with the latch;

said locking strip having retaining means for holding the strip in position on the carrier bar;

said retaining means including an opening and finger means adapted to fit into said opening for securely holding the flexible member in position; and,

said finger means and opening becoming disengaged upon flexing of the flexible member.

4,411,372

PRESSURE VESSEL CONSTRUCTION

Ernest P. Basterfield, and Parker L. Basterfield, both of Johannesburg, South Africa, assignors to Chern Developments Limited, Transvaal, South Africa

Filed Dec. 3, 1981, Ser. No. 326,666

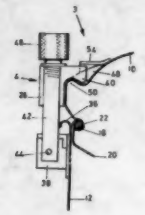
Claims priority, application South Africa, Dec. 4, 1980, 80/7573

Int. Cl.³ B65D *45/00*

U.S. Cl. 220—327 **3 Claims**

1. A pressure vessel comprising a container; a seamless lid including a peripheral groove formed in an outer surface

thereof by deforming the material of said lid; sealing means located at least partly in said peripheral groove; and a plurality of fastening fixtures, wherein each of said fastening fixtures comprises a threaded shaft which is secured to said container and pivotal relative thereto in a substantially vertical plane, a



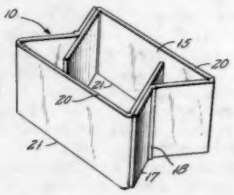
bracket having a hook formation and which is movable along at least a part of said shaft, and which is engageable in a complemental formation on said lid, and a nut which threadedly engages said shaft and is rotatable between a position at which it prevents disengagement and a position at which it permits engagement of said bracket and said lid.

4,411,373

FOLDABLE REINFORCING ELEMENT FOR SHIPPING CONTAINERS

Julius B. Kupersmit, 145-228th St., Springfield Gardens, N.Y. 11413

Filed Oct. 15, 1982, Ser. No. 434,492
Int. Cl.³ B65D 5/36, 5/56
U.S. Cl. 220—470 **2 Claims**



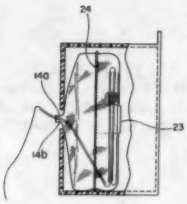
1. An improved foldable reinforcing liner for use with a collapsible reusable shipping container comprising: first and second wall elements, each of said wall elements including a side wall and first and second end walls interconnected to said side wall at opposite ends thereof, said end walls being foldably positioned at substantially a right angle relative to a respective side wall; said first end walls of each of said wall elements having a generally medially positioned transversely extending fold line, said second end walls thereof being rigid; said wall elements being mutually interconnected such that a first end wall of one element is glued to a second end wall of the other element only in an area of said first end wall extending outwardly of said fold line; whereby said liner may be folded when not in use, from a generally rectangular configuration to a generally planar condition without disturbing the planar condition of said second end walls.

4,411,374

TISSUE DISPENSER SYSTEM, PLASTIC OVERWRAP PACKAGE THEREFOR

Harry W. Hotchkiss, Neenah, Wis., assignor to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 3, 1981, Ser. No. 289,819
Int. Cl.³ B65H 1/00
U.S. Cl. 221—63 **5 Claims**



1. An improved facial tissue dispensing system for dispensing a stack of interleaved tissues from a wall mounted type dispensing cabinet, said cabinet including a vertically disposed face plate having a dispensing slot wherethrough a series of interleaved tissues from the stack disposed perpendicular with respect to the face plate may be sequentially dispensed, said system comprising:

a plastic film overwrap package enclosing the stack of tissues, said package being comprised of (1) a rectangular sheet of plastic material so folded as to overlap for the entire length of said sheet along a central region of a last tissue in the stack forming a band, said band being folded, joined and sealed along the overlap and at both ends of the stack, the seals at the ends of the stack providing side walls about the stack of tissues, the overwrap being disposed to provide an air space region between a front face of the package and a first tissue in the stack; (2) means for forming a narrow dispensing opening disposed lengthwise on the front face of said package said opening being such that the edges of the opening partially curl about the edges of the dispensing slot and mechanically adhere to the slot in a manner resisting movement of said package away from the face plate; the surface of the front face of said package being the type which folds and diverges from said opening to form substantially a truncated hip roof shape extending from said opening as each tissue is dispensed from the stack, the forces of the edges of each tissue on the corners of said opening causing tensile forces to extend across the front face of said package causing compressive forces to be applied between the outer extremes of said front face and the back face of said package opposing movement of the stack of tissues away from the back face as the tissues are dispensed from the cabinet, whereby sequential dispensing of said tissues is improved and collapse of said plastic package is minimized.

4,411,375

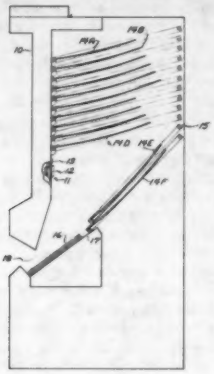
NOVEL SHELF ARRANGEMENT FOR A DROP SHELF VENDING MACHINE

Donald K. Christian, 119 Woodbine Ter., Spartanburg, S.C. 29304

Filed Aug. 13, 1979, Ser. No. 66,481
Int. Cl.³ G07F 11/06
U.S. Cl. 221—90 **3 Claims**

1. A vending machine including a plurality of varying width dispensing shelves, pivotally mounted at one side and, a shelf

support system comprised of a plurality of shelf support means for supporting said shelves at a side other than said one side,



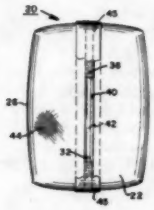
said shelves being so oriented as to facilitate the loading of more than one shelf at a time.

4,411,376

LIQUID SOAP DISPENSER

Robert A. Bennett, 170 Sturbridge Rd., Easton, 06425, and Walter S. Nuckols, 119 Putnam Rd., Bethel, Conn. 06801

Filed Nov. 9, 1981, Ser. No. 319,304
Int. Cl.³ B65D *37/00*
U.S. Cl. 222—212 **6 Claims**



1. A soap dispenser comprising:

a hollow flexible body adapted to contain liquid soap, said body having the general shape of a bar of soap with oppositely disposed spaced apart main front and rear surfaces connected along their edges by a continuous peripheral surface which extends between these main surfaces at right angles thereto, the said body carrying a groove which defines a closed loop and extends across the main surfaces and the peripheral surface, said groove being disposed in the middle of the main surfaces, said body having a discharge port disposed in the peripheral surface and in said groove, said port communicating with the interior of the body, whereby when said body contains soap and is squeezed said soap is discharged through said port, said body having a fill opening in said peripheral surface, spaced apart from said port and much larger than said port, through which said soap can be poured into said body; and

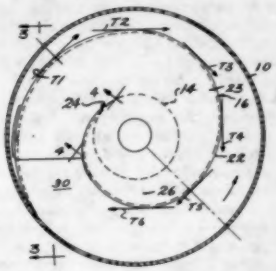
a flexible o-ring disposed in said groove and overlying said opening, said ring having a raised position in said groove when the body is squeezed to dispense soap and otherwise having a lowered position in said groove, said o-ring carrying a sealing plug which is snap fitted into sealing engagement with said opening.

4,411,377

SPIRAL SCOOP ROTARY PLOW FEEDER

Frank J. Miksitz, Phillipsburg, N.J., assignor to UFI Engineering & Manufacturing Co., Inc., Bethlehem, Pa.

Filed Aug. 10, 1981, Ser. No. 291,765
Int. Cl.³ B65G *65/48*
U.S. Cl. 222—342 **5 Claims**



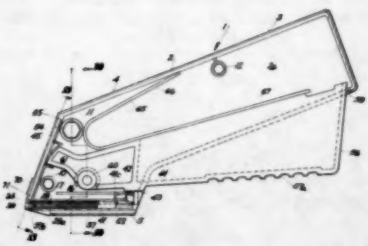
1. A rotary plow feeder for feeding granular material downwardly with gravity assist through a feed aperture in the bottom wall of a container having a generally circular side wall adjacent the bottom, the feeder comprising: a rotary scoop disposed above and close to the aperture, the scoop including a plow blade which is continuously curved in a generally spiral path along essentially its entire length about an axis coinciding with the axis of the aperture and which extends essentially around the whole of the periphery of the aperture, the outer end of the plow blade being disposed close to the container side wall and the inner end of the plow blade being disposed adjacent the aperture; and a shroud plate overlying and connected to the plow blade so that the shroud plate, plow blade and container bottom form a scooping cavity into which granular material flows, during rotation of the scoop about the axis of the spiral, from the container along a path located between the end portions of the plow blade and from which granular material flows uniformly and simultaneously over essentially the whole of the periphery of the feed aperture in the form of an annular stream.

4,411,378

DISPOSABLE SURGICAL STAPLING INSTRUMENT HAVING AN ANVIL WITH COEXTENSIVE LATERAL FLANGES

Thomas E. Warman, Williamsburg, Ohio, assignor to Senco Products, Inc., Cincinnati, Ohio

Filed Jan. 28, 1981, Ser. No. 229,080
Int. Cl.³ B25C *5/02*
U.S. Cl. 227—19 **3 Claims**



1. A surgical stapling instrument for forming and implanting surgical staples in the skin or fascia of a patient, said instrument comprising an elongated body made up of two mating halves

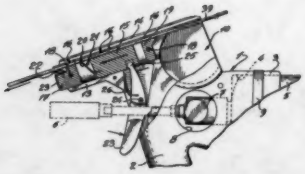
forming a rearward handle portion, a forward portion and a surgical staple magazine portion located beneath said forward portion, an anvil plate mounted within said magazine portion, said anvil plate having forward and rearward ends and comprising an elongated member of inverted U-shaped cross section having a longitudinally extending raised planar central portion, said raised central portion having longitudinal edges terminating in coextensive downwardly depending portions, each of said downwardly depending portions terminating in a coextensive flange portion extending laterally of said downwardly depending portion and said central portion, a coextensive extension on said central portion at said forward end of said anvil plate lying at a slight upward angle to said central portion, said extension having an upper surface comprising an anvil surface, a row of surgical staples slidably mounted on said anvil plate, a feeder assembly mounted in said magazine portion to constantly urge and advance said row of staples along said anvil plate toward said anvil surface to locate the forwardmost staple of said row thereon to be formed and implanted thereabout and to be disengaged therefrom when formed and implanted, said surgical staples of said row each having a crown portion terminating at its ends in downwardly depending legs, said surgical staples of said row straddling said raised central portion and said downwardly depending portions of said anvil plate, the free ends of said legs of said surgical staples being supported by said lateral flange portions of said anvil plate, said lateral flange portions having coplanar extensions at said forward end of said anvil plate, said coplanar extensions extending laterally and along said coextensive extension such that the legs of all of said surgical staples of said row, except the forwardmost staple of said row, are supported by said lateral flange portions and said coplanar extensions as said row of staples is urged and advanced along said anvil plate and said coextensive extension by said feeder assembly, said body having a rectilinear inside surface extending upwardly with respect to said anvil surface, a staple driver located within said forward body portion above said anvil surface, said driver being slidable along said rectilinear surface and shiftable therealong longitudinally between a first retracted position and a second extended staple forming and implanting position, a trigger pivotally mounted within said body and rotatable between unactuated and actuated positions, said staple driver having a pair of spaced rearwardly extending tabs thereon, said trigger having a nose portion abutting said stable driver to maintain said staple driver against said inside body surface and being located between said tabs to shift said staple driver between said first and second positions, a rearward portion of said trigger being partially exposed beneath said rearward handle portion of said body for actuation by a surgeon, and means within said body to bias said trigger to said unactuated position and said staple driver to said first position.

4,411,379

SOLDER FEEDING GUN AND ATTACHMENT

Real Gravel, 9026 de la Montagne St., Valcourt, Canada J0E 2L0

Filed Jul. 10, 1981, Ser. No. 282,072
Claims priority, application Canada, Oct. 30, 1980, 363573
Int. Cl.³ B23K *3/00*
U.S. Cl. 228—52 **3 Claims**



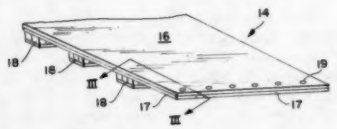
1. A solder feeding gun to be used in combination with a soldering torch, of the type including a combustible gas-containing cylindrical tank and a nozzle protruding from one end of said tank, said gun comprising an elongated body having a front end and a rear end, clamp means to secure said tank to the rear end of said body with said nozzle exposed at the forward end of said body, a pistol type handgrip depending from said body to hold the same and said tank in operative position, said body having a cavity at its rear end for holding a spool of coiled solder wire, said body forming a longitudinally-extending straight piston chamber opened at the front of said body and in full communication with said cavity, an outlet block removably held within the front portion of said piston chamber, a solder-straightening block removably held within the rear portion of said piston chamber adjacent said cavity, a piston slidable within said piston chamber intermediate said two blocks and removable from said piston chamber, said two blocks and said piston each having a longitudinal passage for slidably receiving and guiding said solder wire, means to maintain said blocks and said piston with their respective passages in mutual register, a finger-actuated lever pivotally carried by said body and removably connected to the piston to displace the latter towards said outlet block, spring means connected to said lever and biasing the same to displace said piston towards said solder-straightening block, a resilient pusher blade fixed to said piston and biased against said solder wire to grip and move said wire through said block passages during movement of said piston towards said outlet block and to release the grip on said wire during movement of said piston towards said straightening block, and a resilient means carried by one of said blocks and resting on said wire to bias the same against displacement during movement of said piston towards said solder wire-straightening block, said piston operatively displacing said solder wire outwardly of the front end of said body, thereby feeding said wire to be melted by heat produced by the nozzle of the soldering torch.

4,411,380

METAL MATRIX COMPOSITE STRUCTURAL PANEL CONSTRUCTION

Robert R. McWithey, Newport News; Dick M. Royster, Hampton, and Thomas T. Bales, Newport News, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 30, 1981, Ser. No. 280,155
Int. Cl.³ B23K *1/04*; B32B *3/12*
U.S. Cl. 228—181 **6 Claims**



1. A method of fabricating lightweight structural panels suitable for use in aerospace vehicular construction comprising:

providing a metal exterior skin for the structural panel,

brazing doublers along the interior periphery of the exterior skin with the doublers being of the same composition and of essentially the same thickness as the exterior skin,

brazing a plurality of equally spaced parallel honeycomb stringers along the interior surface of the exterior skin with one end surface of the honeycomb stringers being confined within the area defined by the doublers and the other end of each honeycomb stringer being capped so as to leave the honeycomb cell sidewalls exposed; and

wherein the metal exterior skin is a metal matrix composite laminate sandwich construction having a first layer of titanium, three adjacent layers of silicon carbide coated

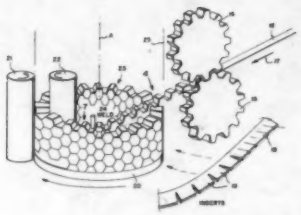
boron fibers embedded within an aluminum alloy matrix, an intermediate layer of Ti-6Al-4V titanium alloy, three additional layers of silicon coated boron fibers embedded within an aluminum alloy matrix, and a second layer of titanium.

4,411,381

HONEYCOMB MANUFACTURING METHOD

Nelson C. Ittner, P.O. Box 1266, Blue Jay, Calif. 92317, and Gary N. Ittner, Los Angeles, Calif., assignors to Nelson C. Ittner, Los Angeles, Calif.

Filed Apr. 2, 1982, Ser. No. 364,808
Int. Cl.³ B32B 3/12
U.S. Cl. 228—181 **4 Claims**



2. A honeycomb manufacturing method including the steps of:

(a) corrugating a ribbon of honeycomb core material in a continuous manner as it moves along a path so that one longitudinal edge defines a first truncated triangular wave form when viewing the ribbon from one side and the opposite longitudinal edge defines a second truncated triangular wave form when viewing the ribbon from the opposite side, the height of the first truncated triangular wave form being greater than the height of the second truncated triangular wave form so long as the path is straight;

(b) inserting brazing material on the corrugated ribbon;

(c) guiding the path of movement of the core material with brazing material into an helical stack with the brazing material between successive helical turns; and

(d) welding the helical turns of the core material together so that a cylinder of honeycomb material results, the outside wall of the cylinder being made up of said one longitudinal edge of the core material and the inside wall being made up of said opposite longitudinal edge of the core material, the radius of the cylinder being such that resulting stretching of the one longitudinal edge and compressing of the opposite longitudinal edge equalizes the said heights of the first truncated triangular and second truncated triangular wave forms respectively defined by the edges so that the lateral wall of the cylinder is rectilinear in a direction parallel to the axis of the cylinder and the planes of the nodes of the honeycomb material are normal to said axis.

4,411,382

ERECTABLE DISPLAY ASSEMBLY WITH SELF-CONTAINED PACAKGED PRODUCT

Ronald H. Taub, 154 Sheridan Rd., Highland Park, Ill. 60035

Filed Jun. 21, 1982, Ser. No. 390,257
Int. Cl.³ B65D 5/52, 25/24
U.S. Cl. 229—16 D **25 Claims**

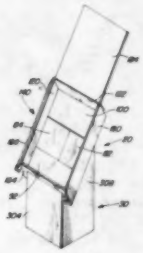
1. A standing, self-supporting display assembly of corrugated paper or the like for displaying articles carried thereby, said display assembly comprising, in combination, a base, and a tray surmounting and supporting on said base, said base including an upstanding generally rectangular perimetric wall including hingedly joined front and rear walls and side walls,

said base being collapsible along prescored fold lines to provide a compact packet for shipment and storage,

said front wall of said base being of a lesser height than said rear wall and said front wall having generally horizontally extending upper edge for supporting said tray,

said tray having a lateral width exceeding that of said base,

each of said side walls of said base defining a pair of upwardly presented intersecting edge means for support of said tray thereon, said pair of intersecting edge means each including first edge means and second edge means disposed to extend substantially at 90° to one another and each pair of said edge means adapted to support respectively a lower end panel and a floor panel of said tray carried by said base,



each of said pair of said intersecting edge means intersecting at a locus generally forwardly in respective opposed said side walls and below said upper edge of said front wall of said base,

said first edge means being angled rearwardly and downwardly from said upper edge of said front wall and said second edge means projecting upwardly and rearwardly from a lower terminus of said first edge means,

said tray as supported on said base being disposed to project generally upwardly and rearwardly from said upper edge of said front wall of said base, and

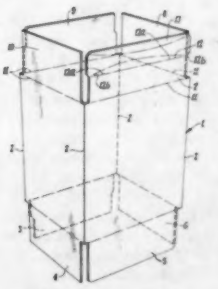
cooperating intercoupling means carried by said base and by said tray for securing said tray to said base.

4,411,383

CARTON AND INTEGRAL HANDLE THEREFOR

Charles K. Morris, Templestowe, Australia, assignor to Pak Pacific Corporation Pty. Limited, Victoria, Australia

Continuation-in-part of Ser. No. 232,046, Jan. 23, 1981, abandoned. This application Dec. 28, 1982, Ser. No. 453,940
Int. Cl.³ B65D 5/46
U.S. Cl. 229—52 B **4 Claims**



1. A formed carton including at one end a pair of inner closing flaps and a pair of outer covering flaps adhered to said

closing flaps, a handle strip connected to the end portion of one covering flap and extending across the carton and joined by a weakened zone to said covering flap; and an adhesive tape extending along said strip and onto the carton wall adjacent each end of said strip thereby to join said strip at its ends to the carton, said strip being severable from the covering flap at said weakened zone, said handle strip generally lying flat across and bisecting the end of the carton, the other covering flap extending under the handle strip to push the handle strip above the level of the outer covering flaps, thereby providing a raised handle strip having an exposed edge along one length thereof to allow access for fingers.

4,411,384

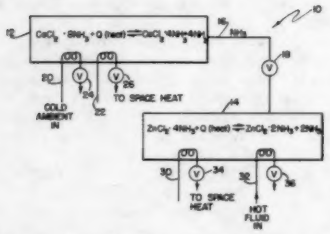
HEAT DRIVEN HEAT PUMP USING PAIRED AMMONIATED SALTS

Richard M. Dunlap, Middletown, R.I., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 29, 1980, Ser. No. 182,367

Int. Cl.³ G05D *23/00*; F25B *13/00*

U.S. Cl. 237—2 B **3 Claims**



1. A heat driven heat pump comprising:

a first ammoniated salt;

a second ammoniated salt;

a first heating source of ambient winter temperature for heating said first salt;

a second heating source of temperature higher than said first heating source, said second heating source for heating said second salt;

first means for applying heat to said first ammoniated salt from said first heating source for heating, increasing the pressure, and dissociating ammonia from said first ammoniated salt forming a first lower ammoniated salt and transferring the dissociated ammonia to said second ammoniated salt to further ammoniate said second ammoniated salt at a predetermined temperature forming a second higher ammoniated salt with the release of heat at said predetermined temperature and for providing comfort heating; and

second means for applying heat to said second higher ammoniated salt from said second heating source for heating, increasing the pressure and dissociating ammonia from said second higher ammoniated salt, and transferring the dissociated ammonia to said first lower ammoniated salt to ammoniate said first lower ammoniated salt forming said first ammoniated salt at said predetermined temperature with the release of heat at said predetermined temperature and for providing comfort heating.

4,411,385

CONTROLLER FOR THE OPERATION OF HEATERS

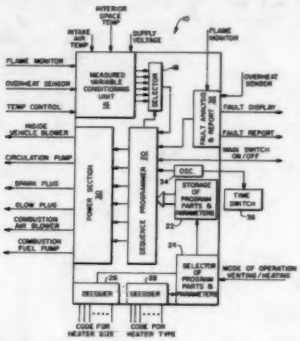
Falk Lamkewitz, Munich, Fed. Rep. of Germany, assignor to Webasto-Werk W. Baier GmbH & Co., Munich, Fed. Rep. of Germany

Filed Aug. 19, 1981, Ser. No. 294,228

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1980, 3031410

Int. Cl.³ G05D *23/00*

U.S. Cl. 237—2 A **16 Claims**



1. A controller for controlling the operation of a heater comprising:

means for storing a plurality of control and regulation programs for the operation of a plurality of different heaters, wherein said storage means includes various preselectable parameters for running of said stored programs;

means for selecting one of said plurality of control and regulation programs for a particular heater from among said plurality of different heaters in accordance with selection instructions identifying said particular heater;

means for providing control and regulation signals to said particular heater in accordance with the selected control and regulation program; and

means for receiving disturbance variables indicative of heater operation and environmental conditions pertaining to heater operation;

wherein said means for providing control and regulation signals includes a programmer for receiving said disturbance variables and providing said control and regulation signals in accordance with said disturbance variables and said selected program, wherein said heater is a vehicle heater and wherein a vehicle supply voltage is input to said programmer as a disturbance variable, said means for providing control and regulation signals providing such signals to preheat said vehicle prior to starting an engine of said vehicle.

4,411,386

APPARATUS FOR CONTROLLING SPRAY PATTERN

Lynnford E. Disbrow, 1400 W. Bruneau, Kennewick, Wash. 99336

Filed Dec. 28, 1981, Ser. No. 334,556

Int. Cl.³ B05B *3/00*

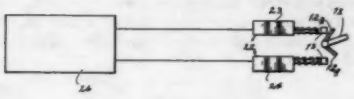
U.S. Cl. 239—177 R **13 Claims**

1. In a pivot irrigation system having a reciprocating end gun with a reversing mechanism for changing the direction the end gun swings, an apparatus for controlling the spray pattern being delivered by the end gun in response to wind conditions, comprising:

sensing means for detecting wind conditions;

end gun controlling means operably connected to said sensing means and having at least one adjustable stop adjacent

to the end gun for engaging the reversing mechanism to change the direction the end gun swings and thereby



control the spray pattern of the end gun in response to wind conditions.

4,411,387

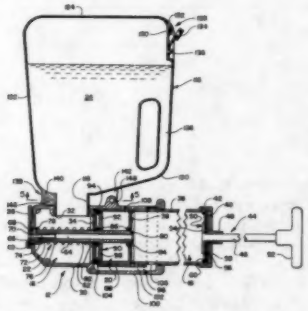
MANUALLY-OPERATED SPRAY APPLICATOR

Donald J. Stern, 127 Underhill Rd., and Jon I. Allsop, 2317 N. Shore Rd., both of Bellingham, Wash. 98226

Filed Apr. 23, 1982, Ser. No. 371,276

Int. Cl.³ B05B 7/24

U.S. Cl. 239—345 **26 Claims**



1. A manually-operated spray applicator for discharging a coating fluid residing therein by propelling said fluid as a spray from an outlet port with an airjet issuing slightly upstream thereof and created upon the manual stroke of an air-compression piston, said applicator comprising:

(a.) receiving chamber means wherein a coating fluid is contained, having an inlet port for admitting a quantity of said fluid thereto and an outlet port for discharging a portion thereof;

(b.) a closed compression chamber having sidewalls and opposed end walls, receiving a manually-operated air-compression piston having a stroke length defined generally between said end walls;

(c.) stroke-responsive sealing stem means having a central airway with an airjet orifice at the distal end thereof in registration with said outlet port and communicating at its proximal end with said compression chamber, said stem means being reciprocable in response to the location of said air-compression piston along the stroke length thereof, from a biased sealing position wherein said stem means is in sealing engagement with said outlet port to a spray discharge position wherein said stem is retracted and said airjet orifice is disposed within said receiving chamber slightly upstream of said outlet port; and,

(d.) spray control means for reciprocating said stem means in response to the location of said air-compression piston along said stroke length, said spray control means first retracting said stem means to said spray discharge position and then returning said stem means to said sealing position intermediate the length of said stroke, whereby said stem means is in said sealing position at the beginning and end of each stroke of said air-compression piston.

4,411,388

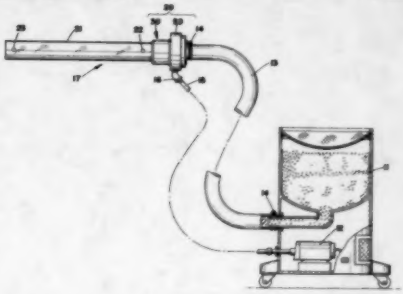
APPARATUS FOR CONVEYING LIGHTWEIGHT PARTICULATE MATTER

Jack E. Muck, 1511 Clarence Ave., Lakewood, Ohio 44107

Filed Mar. 26, 1981, Ser. No. 247,895

Int. Cl.³ B05B 7/04

U.S. Cl. 239—419.5 **3 Claims**



1. In an apparatus of the jet suction type for pneumatically conveying lightweight particulate matter and ejecting it at a desired location, said apparatus including a source of said particulate matter, a source of air pressure, a nozzle, transport tubing means for conveying said particulate matter from its said source to said nozzle, and air pressure tubing means for conveying air pressure from its said source to said nozzle, an improved nozzle comprising

a generally tubular housing with rear and front ends, said housing containing therein a central transport duct with an axis passing therethrough from said rear to said front end and being joined at said rear end of said housing with said transport tubing means whereby said particulate matter may pass freely from said transport tubing means into and through said central transport duct, said housing further being provided with a plurality of jet ducts having axes and having openings located peripherally about said front end of said central transport duct, each of which jet ducts is joined with said air pressure tubing means whereby air is forced through said jet ducts, exiting said jet ducts as air jets,

a nozzle tube with a cylindrical interior, an axis, a rear end and a front end, said nozzle tube being joined at its rear end with said front end of said housing, said transport duct and jet ducts opening into said nozzle tube interior, said jet duct axes being inclined forwardly toward the axis of said nozzle tube such that said air jets meet each other at a point on said axis of said nozzle tube, said air jets meeting said axes of said nozzle tube at an angle of between 3 and 30 degrees, and

said nozzle tube being provided with a first and a second set of holes, said first set being a plurality of holes spaced generally evenly about the circumference of said nozzle tube rearwardly of said point where said air jets meet, and said second set being a plurality of holes spaced generally evenly about the circumference of said nozzle tube frontwardly of said point where said air jets meet.

4,411,389

FILLER GUN SUITABLE FOR CAVITY INJECTION

John D. Harrison, Newbury, England, assignor to Shell Internationale Research Maatschappij, B. A., Netherlands

Filed Nov. 27, 1981, Ser. No. 325,181

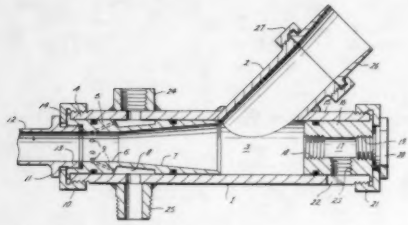
Claims priority, application United Kingdom, Dec. 2, 1980, 8038646

Int. Cl.³ B05B 7/00

U.S. Cl. 239—427.5 **7 Claims**

1. A filler gun suitable for injecting a mixture of a granular

or particulate solid and a liquid binder into a cavity, which comprises a hollow body having an outlet at one end, a binder inlet for liquid binder at the other end, and a side inlet for granular or particulate solid, which side inlet is directed towards the outlet at an angle of less than 90° with respect to the direction of flow of liquid binder from the binder inlet to the outlet in operation of the gun, characterized in that an



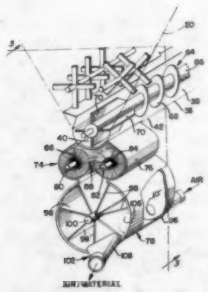
outlet sleeve is releasably located in the body between the side inlet and the said one end, and an inlet sleeve is releasably located in the body between the side inlet and the said other end, the inlet sleeve having an axial bore and a side passage opening into the bore which passage is adapted for attachment of a liquid binder supply line, and the body is slotted to enable withdrawal of the inlet sleeve therefrom without prior detachment of an attached binder supply line.

4,411,390

INSULATION BLOWING AND SPRAYING APPARATUS

Homer G. Woten, 912 Perrin Ave., NW., Winter Haven, Fla. 33880

Filed Apr. 6, 1981, Ser. No. 251,710
Int. Cl.³ B02C *17/16*
U.S. Cl. 241—98 **29 Claims**



1. Apparatus for producing particulate material from compact masses of material such as insulation materials and pneumatically dispensing such materials comprising,

a hopper for containing said compact masses,

an outlet positioned towards the bottom of said hopper,

a shredding zone located within an upper portion of said hopper for receiving said materials and shredding any large compact masses of said material into smaller masses or nodules,

shredding means within said zone and including a plurality of rotating elements for receiving and shredding said compact masses,

conveying means positioned below said shredding means and above said outlet for moving said material along said hopper,

a tearing and separating zone positioned below said outlet and receiving said material passing through said outlet to tear and separate any nodules of said material into particulate material,

said tearing and separating zone including a plurality of rotating brush elements through which said material passes to be torn and separated, and

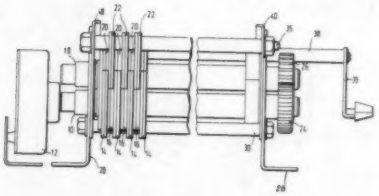
pneumatic transport means positioned below said tearing and separating zone to receive and dispense said particulate material.

4,411,391

DOCUMENT SHREDDING MACHINES

Dennis P. Crane, Olton, England, assignor to Ofrex Group Limited, London, England

Filed May 15, 1981, Ser. No. 263,979
Claims priority, application United Kingdom, May 27, 1980, 8017324
Int. Cl.³ B02C *18/18*
U.S. Cl. 241—232 **6 Claims**



1. A document shredding machine of the kind comprising a machine frame, two cutter assemblies each comprising a shaft mounted on the frame and cutter discs mounted on the shaft at spaced intervals, the shafts being substantially parallel and spaced apart a distance such that the discs on one shaft extend into the spaces between the discs on the other shaft into overlapping relationship and form a nip, the machine comprising drive means mounted on the frame which is operative to rotate the shafts in opposite directions so that documentary material fed into the nip of the machine is cut into strips by the action of the overlapping discs, the improvement wherein one of the cutter assemblies is mounted so as to be capable of separative movement relative to the other cutter assembly against the action of resilient means, the machine including stop means on the machine frame which may be moved between a stop position in which it maintains the two cutter assemblies in prefixed overlapping relationship and prevents such relative separative movement and a release position in which such relative separate movement against the action of the resilient means is permitted, said stop means when in its release position limiting the separative movement to an extent so as to maintain the cutter discs of the two assemblies in said overlapping relationship.

4,411,392

SPEED-COMPENSATING DEVICE FOR THE FEEDING OF THREADS TO A WEAVING OR KNITTING MACHINE

Alfred Boehm, and Eberhard Richter, both of Naila, Fed. Rep. of Germany, assignors to LIBA Maschinenfabrik GmbH, Naila, Fed. Rep. of Germany

Filed Mar. 13, 1981, Ser. No. 243,351
Claims priority, application Fed. Rep. of Germany, Apr. 3, 1980, 3013203
Int. Cl.³ B65H *54/20, 59/38*
U.S. Cl. 242—35.5 R **4 Claims**

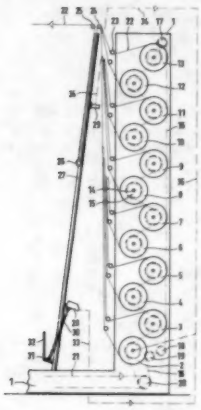
1. An apparatus for feeding threads to a weaving or knitting machine in which the threads are taken up by the machine from spools at different speeds, the apparatus comprising

a common drive system with a plurality of clutch means for drivingly coupling corresponding spools when engaged,

a plurality of compensating pulleys, one for each thread, freely movably within a vertically extending range of travel and biased by gravity for forming variable loops of the threads,

first means for directing the threads tangentially from the spools and downwardly to corresponding compensating pulleys,

second means for directing the threads upwardly from the compensating pulleys and to the machine,



a plurality of first control means, each for detecting the presence of the respective compensating pulley adjacent the lower end of its range of travel to disengage a corresponding clutch means, and

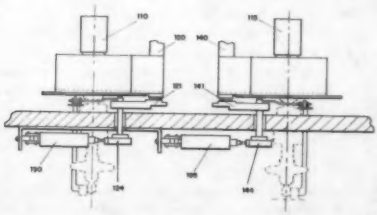
a plurality of second control means, each detecting the presence of a respectively compensating pulley and for operating when the respective compensating pulley is adjacent the upper end of its range of travel to reengage the corresponding clutch means.

4,411,393

WEB TENSION CONTROL APPARATUS

Robert M. Jodrey, Westboro, and Robert J. Scott, Framingham, both of Mass., assignors to Dennison Manufacturing Company, Framingham, Mass.

Filed Jun. 5, 1981, Ser. No. 270,935
Int. Cl.³ B65H *17/02, 17/38, 23/08, 25/04*
U.S. Cl. 242—75.43 **16 Claims**



1. Improved web transport apparatus, of the type including web dispensing means, means for regulating the web tension at the web dispensing means, web takeup means, means for regulating the web tension at the web takeup means, and a metering device for engaging the web and controlling its advance from the web dispensing means to the web takeup means, wherein the improvement comprises improved tension control apparatus including:

a first pneumatic assembly, for controlling the dispensing tension regulating means in response to a first air pressure;

a second pneumatic assembly, for controlling the takeup tension regulating means in response to a second air pressure;

a web engaging member mounted to said metering device to move in response to a tension differential of the engaged web; and

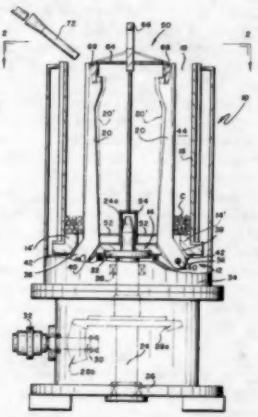
a valve assembly within said metering device actuated by the movement of said web engaging member to vary the air pressure to at least one of said pneumatic assemblies.

4,411,394

POURING REEL

Raymond R. Starvaski, Worcester, and Alfred R. Leger, Grafton, both of Mass., assignors to Morgan Construction Company, Worcester, Mass.

Filed Sep. 3, 1981, Ser. No. 299,158
Int. Cl.³ B21C *47/30*
U.S. Cl. 242—83 **11 Claims**



1. Apparatus for forming a longitudinally moving product length into an upstanding cylindrical coil, comprising:

a rotatable tub having a bottom, a cylindrical side wall and a circular row of pin members arranged concentrically within said side wall, said pin members protruding upwardly from said bottom and being pivotal between substantially vertical positions cooperating with said side wall to define an annular chamber, and inoperative positions inclined inwardly away from said side wall;

a carrier removably inserted in said tub and arranged for rotation therewith, said carrier having a base defining the lower end of said chamber with a central core protruding vertically from said base and with locating means for engaging and urging said pin members into their operative positions arranged on said core;

means for rotating the combination of said tub and said carrier while receiving the longitudinally moving mill product in said chamber, thus forming said product into an upstanding coil supported on said base and radially confined between said side wall and said operatively positioned pin members;

said carrier being adapted for vertical removal from said tub following completion of a coil forming operation, with said coil being supported on said base for removal with said carrier, and with said locating means being disengageable from said pin members during carrier removal to

thereby permit said pin members to pivot to their inoperative positions.

4,411,395

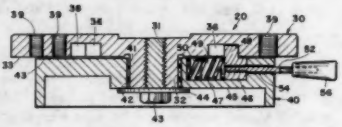
DOWNRIGGER SWIVEL BASE

Charles Steffens, Austin, Tex., assignor to Riviera Marine & Tackle Co., Austin, Tex.

Filed Aug. 14, 1981, Ser. No. 292,877

Int. Cl.³ A01K *89/015*; F16M *11/08*

U.S. Cl. 242—106 **14 Claims**



1. A swivel assembly for mounting a downrigger to a vessel comprising:

a base plate including means for securing said plate to a vessel, said plate having an upper surface and a first recess formed downwardly in said plate through said upper surface, interengaging means movably positioned in said recess and including a portion extending above said upper surface;

a swivel plate rotatably secured to said base plate and including a lower surface facing said upper surface of said base plate, said swivel plate including a second recess for receiving said portion of said interengaging means to permit relative rotation of said swivel plate with respect to said base plate when said interengaging means is in a first position, said swivel plate including locking means communicating with said second recess; and

means for moving said interengaging means to a second position in which said portion of said interengaging means contacts said locking means to prevent rotation of said swivel plate with respect to said base plate.

4,411,396

WINDING MACHINE FOR WINDING STRAND-SHAPED WINDING MATERIAL ON A SPOOL

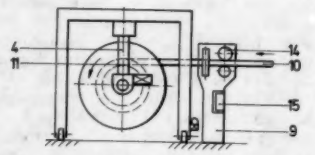
Walter Kytir, Mehlführergasse 28, Vienna A-1238, Austria

Filed Jun. 22, 1981, Ser. No. 276,289

Claims priority, application Fed. Rep. of Germany, Jun. 27, 1980, 3024093

Int. Cl.³ B65H *54/28*

U.S. Cl. 242—158 R **3 Claims**



1. In a winding machine for winding strand-shaped winding material on a rotating spool to which the winding material is fed via a strand guide, having a feed drive for effecting a relatively reciprocating traversing movement between the spool and the strand guide axially of the spool, the feed drive being controlled upon the rising of the winding material at a spool flange in accordance with a pre-established control program during the transition into a next higher winding layer, the improvement comprising

a reversing means for reversing the relative movement between the spool and the strand guide, said reversing means including means for detecting a ratio of the speed of rotation of the spool with respect to speed of arrival of the winding material at the spool and means for reacting to a change in the ratio of the speed of rotation of the spool with respect to the speed of arrival of the winding material including the control program for causing the feed drive to change the relative direction of movement between the spool and the strand guide.

4,411,397

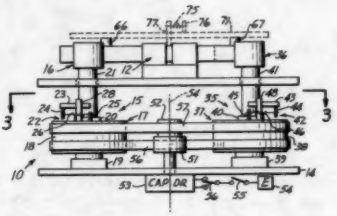
BIDIRECTIONAL TAPE DRIVE SYSTEMS

Herbert Karsh, Laguna Beach, and Irving Karsh, Costa Mesa, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Jul. 18, 1978, Ser. No. 925,673

Int. Cl.³ G03B *1/04*

U.S. Cl. 242—192 **12 Claims**



1. In a bidirectional tape drive, the improvement comprising in combination:

first tape drive means including a first tape drive capstan, first capstan drive means for rotating said first capstan, means for mounting said first capstan for angular movement relative to said first capstan drive means, first elastic coupling means connected to said first capstan and to said first capstan drive means for elastically restraining relative angular movement between said first capstan and said first capstan drive means, and means connected to at least one of said first capstan and first capstan drive means for stopping angular movement of said first capstan relative to said first capstan drive means in a first sense of rotation;

said first elastic coupling means include first resilient means connected to said first capstan and first capstan drive means for biasing angular movement of said first capstan toward said stopping means; and

second tape drive means including a second tape drive capstan, second capstan drive means for rotating said second capstan, means for mounting said second capstan for angular movement relative to said second capstan drive means, second elastic coupling means connected to said second capstan and to said second capstan drive means for elastically restraining relative angular movement between said second capstan and said second capstan drive, and means connected to at least one of said second capstan and second capstan drive means for stopping angular movement of said second capstan relative to said second capstan drive means in a second sense of rotation;

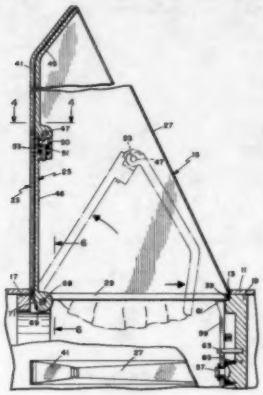
said second elastic coupling means include second resilient means connected to said second capstan and second capstan drive means for biasing angular movement of said second capstan toward said stopping means, and said first and second elastic coupling means acting in opposite angular directions in their restraining functions.

4,411,398

DOUBLE FABRIC RETRACTABLE WING CONSTRUCTION

Larry D. Wedertz, Mira Loma; Oakley G. Ross, Upland, and Byron M. Niemeier, Claremont, all of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Apr. 20, 1981, Ser. No. 255,413
Int. Cl.³ F42B 13/32
U.S. Cl. 244—3.28 **3 Claims**



1. In a missile having an elongated body, the body having an outer wall with a plurality of circumferentially spaced, longitudinally extended slots therein, a retractable self-erecting wing mounted in each slot, each wing comprising:

a single extendable strut member at the leading edge of the wing pivotally mounted in the body at the forward end of the slot and biased to swing outwardly from the body, said strut member including strut sections pivotally connected by pivot means for folding said strut member and said wing cover to the wing stored position and for extending said wing to the operative position;

means on said strut sections for urging said strut sections to the extended position;

a flexible wing cover affixed to said strut member for forming a wing with an internal air pocket in the extended position, said wing cover being movable with said strut member;

means at the bottom of said wing cover to secure the wing cover to the missile body;

retaining means for holding the wing cover in the stored position with said strut member and folded wing cover folded within the slot, said retaining means comprising a substantially U-shaped rod connected to the missile body and the bottom portion of said wing cover, with the legs of said U-shaped member sufficiently spaced apart to pass the folded wing cover and folded strut member therebetween; and

extension means operatively mounted on the body for extending said wing.

4,411,399

RETRACTABLE NOZZLE FAIRING SYSTEM FOR AEROPLANE CENTER BOOST ENGINE

Donald W. Hapke, Issaquah, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 29, 1981, Ser. No. 306,906
Int. Cl.³ B64C 1/38; B64D 29/04
U.S. Cl. 244—130 **46 Claims**

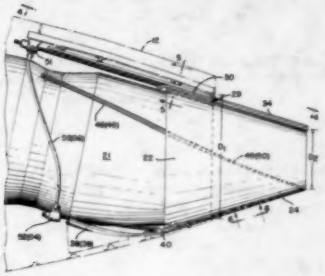
1. A structural assembly having a variable area outlet comprising, in combination:

(a) a fixed tubular member having a truncated conical end portion defining an outlet of fixed predetermined diameter at the apical end thereof;

(b) a fairing member formed of sheet-like flexible material at least partially surrounding said truncated conical end portion of said tubular member, said fairing member being free for relative longitudinal translation with respect to said tubular member;

(c) means for mounting said fairing member on said fixed tubular member with freedom for controlled longitudinal translation relative to said tubular member between: (i) a retracted position partially surrounding said truncated conical end portion of said tubular member; and (ii), a deployed position wherein said fairing member defines a truncated conical extension of said truncated conical end portion of said tubular member with said truncated conical extension having an outlet of substantially reduced diameter at the apical end thereof;

(d) said mounting means including track defining means and



track follower means with one of said track defining means and said track follower means being fixedly secured to said fairing member and the other of said track defining means and said track follower means being fixedly secured to said tubular member so as to permit said sheet-like fairing member to: (i) gradually expand as it translates relative to said tubular member from a fully deployed truncated conical position to a fully retracted position with the opposed longitudinal edges of said fairing member parted with respect to one another; and (ii), gradually contract as it translates relative to said tubular member from a fully retracted position to a fully deployed position with the opposed longitudinal edges of said fairing member being abutted together when in the fully deployed position so as to form said truncated conical extension; and,

(e) actuating means for translating said fairing member between a fully deployed position and a fully retracted position.

4,411,400

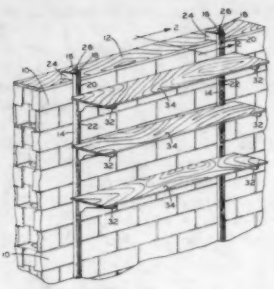
SHELVING SYSTEM

Lynn E. Everett, New Philadelphia, Ohio, assignor to Tusco Manufacturing Co., Gnadenhutten, Ohio

Filed Mar. 20, 1981, Ser. No. 245,998
Int. Cl.³ E04G 3/00
U.S. Cl. 248—216.1 **17 Claims**

1. A shelving system for supporting horizontally disposed shelving adjacent a vertical wall surface having a horizontally extending sill, the system including at least a pair of spaced-apart vertically extending rail members each having a pair of spaced apart, interconnected side walls, said rail member having means for receiving shelving support brackets; and means attached to the upper end of said rail members for releasably securing said rail members to the horizontally extending sill, said securing means including a separate generally vertical plate portion extending outwardly from the upper end portion

of each of said side walls of said rail members, each of said plate portions provided with downwardly extending prong means adapted to securely engage the horizontally extending



sill for supporting said rail member adjacent the vertical wall beneath the sill and militating against any swinging movement of said rail member along the wall surface.

4,411,401

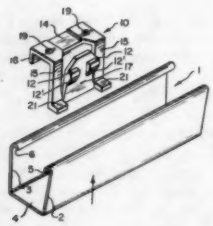
HEADRAIL MOUNTING BRACKET

Richard N. Anderson, Owensboro, Ky., assignor to Hunter Douglas, Inc., Totowa, N.J.

Filed Feb. 23, 1981, Ser. No. 236,726

Int. Cl.³ A47H *1/14*

U.S. Cl. 248—262 **18 Claims**



1. A headrail bracket for mounting a substantially U-shaped venetian blind headrail where said headrail has oppositely disposed shoulder mounts thereon; characterized in that said bracket has first and second oppositely disposed hanger portions which face away from each other and are movable towards and away from each other adapted to engage and support said shoulder mounts, said bracket has resilient means for normally resiliently urging said first hanger portion away from said second hanger portion to resiliently lock a headrail to the bracket wherein said first hanger portion may be moved against the resilient means and toward the second hanger portion to allow disengagement of a hanger portion from a mounting shoulder.

4,411,402

ADJUSTABLE INDICATOR HOLDERS

Max P. Keller, 3330 Ledyard Way, Aptos, Calif. 95003

Filed Nov. 3, 1980, Ser. No. 203,358

Int. Cl.³ E04G *3/00*

U.S. Cl. 248—284 **8 Claims**

1. An adjustable indicator holder comprising:

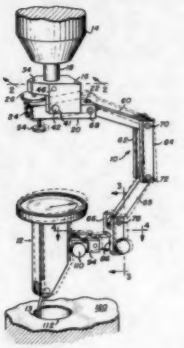
a body member including

means for engaging a spindle device,

a transversely disposed elongated arm pivotally secured thereto at a point intermediate its ends, and

adjustment means for applying a pivoting force to said lever arm;

articulated linkage means including a plurality of linking elements frictionally engaged to each other and having one extremity thereof pivotally attached to said lever arm, each said element of said linkage means being secured to an adjacent element by means of pivot pins the axes of which all lie in parallel lines; and



clamping means attached to the other extremity of said linkage means, said clamping means being adapted to clampingly engage a saturated indicator means and being rotatable relative to said linkage means and about an axis normal to planes including the axes of said pivot pins whereby said indicator can be roughly positioned by frictionally deforming said linkage means, and said adjustment means can be used to finely position said indicator means with any desired accuracy.

4,411,403

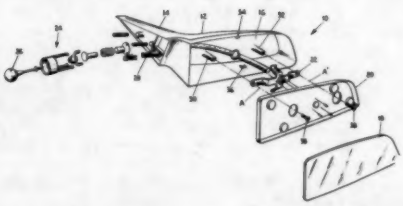
PIVOT SUPPORT BRACKET FOR MIRROR ASSEMBLY

David L. Tomsu, East Grand Rapids, Mich., assignor to Keeler Brass Company, Grand Rapids, Mich.

Filed Nov. 23, 1981, Ser. No. 323,965

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—575 **9 Claims**



1. A mirror assembly for a vehicle comprising:

a housing;

a mirror;

attachment means in said housing for supporting said mirror in said housing;

support means for pivotably mounting said mirror to said attachment means;

said support means including first and second prestressed arm means for mounting said support means each said arm means having a pair of opposing arms, to said attachment means, said first arm means being mounted in tension and said second arm means being mounted in compression;

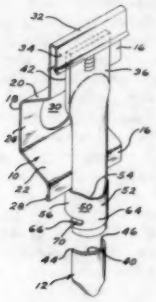
wherein said prestressing of said first and second arm means serves to reduce vibration of the mirror relative to the vehicle and thereby substantially reduce blurring of images on said mirror.

4,411,404

HOLDING CLIPS FOR STAKES SUPPORTING METAL CONCRETE FORMS

Albert P. Weisbach, Louisville, Ky., assignor to Cardinal Manufacturing Co., Louisville, Ky.

Filed Jun. 9, 1982, Ser. No. 386,510
Int. Cl.³ E01C 7/00
U.S. Cl. 249—3 **5 Claims**



1. The combination of an interlocking metal concrete joint form supported on a plurality of vertical stakes for use in pouring concrete slabs, said combination comprising:

a. a plurality of expendable metal stakes, each stake being a narrow, elongated member having a main body of semi-circular shape in transverse cross section, the top end of each stake being generally flattened to create a generally straight edge on one side of the stake that includes the two vertical parallel sides of the semi-circular shape;

b. and an expendable, relatively rigid, elongated sheet metal form with a transverse cross section having a vertically extending planar portion with an offset protruding key portion adjacent its mid-height, and an inverted hook portion adjacent the top edge of the form on the side that is opposite the said protruding key portion, said hook portion having a downturned flange that is spaced away from the said vertical planar portion and adapted for engaging over the flattened upper end of the said vertical stakes;

c. the invention comprising a separate holding clip for each stake which is made to straddle the main body of the stake after the elongated form is supported on the spaced stakes, the clip having an upper portion with finger means that are adapted to engage the lower edge of the sheet metal form, on the side of the form opposite the stake and the clip having a lower portion with a pair of ear means that are able to snap around the opposite edges of the stake for fastening the lower portion of the sheet metal form against the stake.

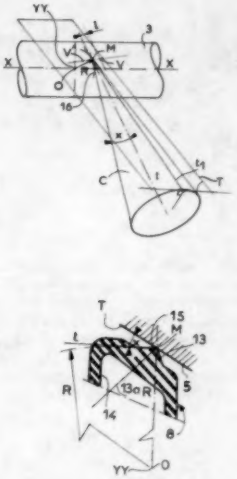
4,411,405

BUTTERFLY-VALVE

Pierre L. C. C. Barbe, Toul, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed Jun. 30, 1981, Ser. No. 279,142
Claims priority, application France, Jul. 18, 1980, 80 15925
Int. Cl.³ F16K 1/22
U.S. Cl. 251—306 **23 Claims**

1. In a butterfly-valve comprising a tubular body which defines a flow passage having a flow axis and a butterfly closure member mounted in said body to rotate about an axis of rotation perpendicular to said flow axis, one of two elements consisting of said body and said closure member carrying an elastically yieldable seal element and the other of said elements carrying a surface providing a seat for said seal element, the seat defining a mean line and the seal element defining a seal line, the seal element being adapted to be crushed against the seat in a completely closed position of said butterfly member after contact between the seal element and the seat with coincidence between the seal line and the mean line throughout the peripheral extent of said lines; the improvement wherein the seal element and the seat each have a closed curved configura-



tion when viewed in a direction parallel to said flow axis with the closure member in the closed position and each have a warped curved configuration when viewed in a direction parallel to said axis of rotation, and, when the seal element is in a position in which it has just encountered the seat without crushing of the seal and the seal line and mean line are coincident, at every point M of the seal line throughout the periphery of the flow passage, a plane T tangent to the seat makes an acute angle x with a tangent t to a circle which has a radius R centered on the intersection O of said flow axis and said axis of rotation Y—Y and passes through the point M, said acute angle being at least substantially constant throughout said periphery.

4,411,406

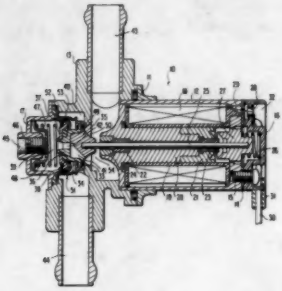
ELECTROMAGNETIC FLOW CONTROL VALVE ASSEMBLY

Masami Inada, Kariya, and Isshi Nomura, Aichi, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed May 18, 1981, Ser. No. 264,386
Claims priority, application Japan, Jun. 4, 1980, 55-75061
Int. Cl.³ F16K 31/06
U.S. Cl. 251—129 **4 Claims**

1. An electromagnetic float control valve assembly comprising a body having first and second ports, a wall within said body having an aperture therethrough located between said first and second ports, a valve member sealingly engageable with said wall about said aperture for controlling fluid communication between said ports, a diaphragm connected between said valve member and said body and defining with said body first and second chambers on opposite sides of said diaphragm, a first passage extending through said valve member providing communication between said first port and said first chamber and a second passage providing communication between said

second port and said second chamber, the effective area of said diaphragm which is subjected to fluid pressure within said second chamber being the same as that of said valve member which is subjected to fluid pressure within said second chamber to thereby offset the force of fluid pressure acting on said valve member, electromagnetic means operatively associated with said valve member for moving said valve member in proportion to the current applied to said electromagnetic



means for proportionally controling fluid communication between said first and second ports and protective guide means comprised of a cylindrical sleeve disposed within said second chamber with said diaphragm located within said cylindrical sleeve for protecting said diaphragm from foreign matter emanating from said second port into said second chamber, said diaphragm being disposed in rolling contact with said sleeve to guide and accurately position said valve member relative to said aperture.

4,411,407

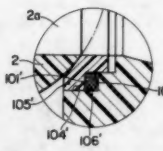
BALL VALVE ASSEMBLY

Youichi Ninomiya, and Kazuhiko Tsuno, both of Nobeoka, Japan, assignors to Asahi Yukizai Kogyo Co., Ltd., Nobeoka, Japan

Continuation-in-part of Ser. No. 253,539, Apr. 13, 1981, abandoned, which is a continuation of Ser. No. 91,807, Nov. 6, 1979, abandoned. This application Jan. 18, 1982, Ser. No. 340,491

Int. Cl.³ F16K *5/06*

U.S. Cl. 251—315 **5 Claims**



1. A disposable ball valve assembly comprising:

(a) a ball valve member made of a plastic resin material;

(b) a valve stem made of a plastic resin material and coupled with the said ball valve member;

(c) a valve body having a valve cavity formed therein for movably mounting said ball valve member, said valve body comprising:

(1) a first body element made of a plastic resin material and having a portion thereof shaped to define a female connection;

(2) a second body element made of a plastic resin material and having a portion thereof shaped to define a male connection inserted into said female connection, said first and said second body elements being permanently coupled and rigidly interconnected to each other by said connections with the end of the male connection being spaced from an interior portion of said first body element to define therebetween a valve cavity holding said ball valve member, said first and said second body elements having bores formed therein and said ball valve member being rotatable between a first position in which a bore formed therein permits fluid flow between the bores formed in said body elements and a second position in which said ball valve member blocks fluid flow between the bores formed in said body elements, portions of said body elements defining said valve cavity having ring grooves recessed therein concentric with the bores formed in said body elements, each of said ring grooves having a first circumferential surface extending outwardly from the stepped bore, a first axial surface extending axially inwardly from outer ends of the first circumferential surface towards said valve cavity, a second circumferential surface extending outwardly from an inner end of the first axial surface, and a second axial surface extending axially inward from outer ends of the second circumferential surface; and

(d) sealing ring means positioned in said ring grooves and sealingly coacting with said ball valve member to prevent fluid flow between said ball valve member and portions of said first and said second body elements defining said valve cavity, said sealing ring means comprising:

(1) a first composite seat ring positioned in the ring groove formed in said first body element; and

(2) a second composite seat ring positioned in the ring groove formed in said second body element, each of said composite seat rings having a larger mass portion made of a hard or semi-hard plastic resin material and kept in sealing and direct contact with said ball valve member and a smaller mass portion made of elastomer or rubber and having a hemispherical shaped sealing projection coacting with a surface of the associated ring groove to provide a sealing area that increases as the pressure exerted on the composite seat ring by said ball valve member increases.

4,411,408

JACK-UP PLATFORM APPARATUS

Felix S. Radovan, Cypress; Albert M. Koehler, and Donald R. Ray, both of Houston, all of Tex., assignors to The Offshore Company, Houston, Tex.

Continuation of Ser. No. 134,012, Oct. 27, 1980, abandoned. This application Dec. 3, 1982, Ser. No. 446,574

Int. Cl.³ B66F *1/00*

U.S. Cl. 254—108 **14 Claims**

1. Jack-up apparatus operable for effecting relative vertical motion between a leg chord of an offshore platform and a deck of the platform, said jack-up apparatus comprising:

reaction means operable to be connected at one end to the platform deck and operably positioned in a posture contiguous to but spaced from the leg chord of the offshore platform;

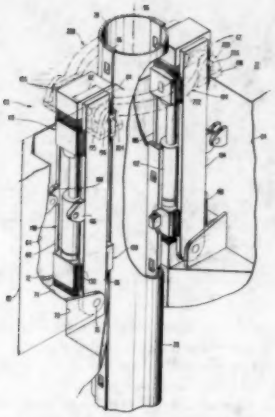
abutment means connected to the other end of said reaction means;

first means for engaging with and disengaging from the leg chord of the offshore platform, said first means for engaging being mounted for sliding translation along said reaction means selectively away from and toward the deck of said offshore platform at generally said one end of said reaction means and for operably abutting against the deck portion of said offshore platform;

second means for engaging with and disengaging from the leg chord of the offshore platform, said second means for engaging being mounted for sliding translation along said reaction means selectively away from and toward said abutment means at generally said other end of said reaction means and for operably abutting against said abut-

ment means connected to the other end of said reaction means;

means connected to said reaction means for maintaining the other end of said reaction means in a posture adjacent to the leg chord of the offshore platform; and hydraulic jack means comprising at least one hydraulic piston, piston rod, and cylinder jack assembly mounted between said first and second means for engaging wherein the cylinder of said jack assembly is mounted upon an upper portion of said first means for engaging the leg chord and the free



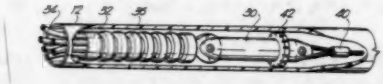
end of the piston of said jack assembly is mounted upon a lower portion of said second means for engaging the leg chord and being operable for translating both of said first and second means for engaging with and disengaging from the leg chord of the offshore platform along said reaction means and between said abutment means and the deck of the offshore platform, wherein selective actuation of said first and second leg chord engaging means and said jack means will function to effect relative vertical motion between the leg chord and the deck of the offshore platform.

4,411,409

TUBE PULLING AND LUBRICATING SYSTEM

Jackson A. Smith, Box 1058, Aldergrove, B.C., Canada V0X 1A0

Filed Sep. 23, 1980, Ser. No. 190,015
Int. Cl.³ E21C 29/16
U.S. Cl. 254—134.3 FT **3 Claims**



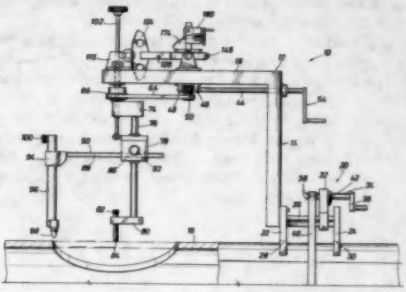
1. Apparatus for drawing a plurality of empty conduits through a single larger tube comprising a single elongated pulling tube having an open end and a closed end with a pulling eye on the exterior of the closed end for connecting the pulling tube to a swivel lead; filler means located in the ends of the empty conduits and being of a length commensurate with that of the pulling tube; said conduits with said filler means being inserted into said pulling tube and a plurality of circumferential crimps spaced along the length of said pulling tube whereby drawing pull applied to said pulling eye is transmitted to the conduits with the filler means.

4,411,410

APPARATUS FOR CUTTING OPENINGS IN PIPES

Joe D. Sumner, 105 Larry Lee Dr., Kerrville, Tex. 78028

Filed Dec. 27, 1982, Ser. No. 452,945
Int. Cl.³ B23K 7/04
U.S. Cl. 266—54 **32 Claims**



1. A mechanism for torch cutting openings and pipes comprising:

(a) a frame structure adapted to be secured in immovable relation to the pipe in which the opening is to be cut;

(b) locator means supported by said frame structure and establishing an axis of torch rotation relative to said pipe about which an opening is to be cut;

(c) torch support means being linearly movable in transverse relation to the axis of torch rotation defined by said locator means and being adjustably positionable to position a cutting torch at a selected radius from said locator means to cut a pipe opening of selected dimension;

(d) rotation means for accomplishing 360° revolution of said torch support means about said axis of rotation; and

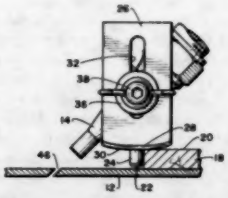
(e) pipe contour tracking means in common driven relation with said rotation means and inducing two cycle linear oscillation of said torch support means during each 360° revolution of said torch support means about said axis of rotation to maintain the cutting tip of a cutting torch secured to said torch support at a predetermined optimum cutting distance from said pipe during said 360° revolution.

4,411,411

CUTTING TORCH GUIDE ATTACHMENT

Casey E. Barthelmess, 222 Lorraine La., Moorpark, Calif. 93021

Filed Feb. 22, 1983, Ser. No. 468,360
Int. Cl.³ B23K 7/02
U.S. Cl. 266—66 **5 Claims**



1. In combination with a cutting torch, said cutting torch having a cutting torch tip, a cutting torch attachment for supporting said cutting torch tip in a desired relation to a workpiece while using said cutting torch to cut the workpiece, said attachment comprising:

a collar having a through opening, said cutting torch tip to

be located within said through opening in a substantially close fitting manner;

a plate having a substantially planar body, said collar being connected to said plate by a plate fastener assembly, said planar body having a substantially planar guide flange, said guide flange having an outer surface, said guide flange extending substantially perpendicular from said planar body; and

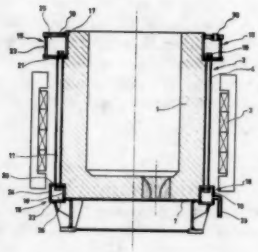
a pin attached to said planar body directly adjacent said guide flange, said pin extending outwardly past said outer surface, whereby said pin is to abut against a side edge of a template with said outer surface resting on the top surface of the template and the user is to move said attachment along the side edge with the cutting torch producing a smoothly contoured cut within the workpiece duplicating the contour of the movement of said pin along said side edge of the template.

4,411,412

METALLURGICAL CONTAINER FOR THE INDUCTIVE TREATMENT OF METAL

Christian Lechevallier, Louverne, France, assignor to Institut de Recherches de la Siderurgie Francaise, Saint-Germain-en-Lay, France

Filed Nov. 23, 1981, Ser. No. 323,907
Claims priority, application France, Nov. 21, 1980, 80 24847
Int. Cl.³ F27B *14/06*
U.S. Cl. 266—242 **8 Claims**



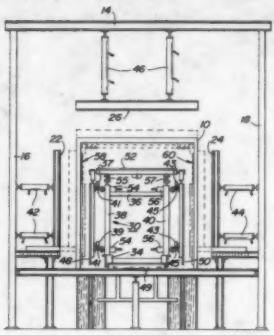
1. A metallurgical container for inductive treatment of metal comprising an inner lining of refractory material having an upper open end and a bottom; a generally tubular enclosure having an upper portion formed as an upper annular casing surrounding said open end of said lining and having a bottom wall and a further portion formed at a median heating zone of the container by a plurality of circumferentially spaced metallic tie rods electrically insulated from each other and extending with upper and lower opposite ends beyond said heating zone, said tie rods being arranged to support said lining and so as to be easily dismountable and being tightly secured at the upper and lower ends of said enclosure, wherein said tie rods being connected by the upper ends beyond said heating zone directly and only to said bottom wall of said upper casing without being connected to other metallic parts of the container; and electrically insulating connecting means which directly connect said upper ends of said tie rods to said bottom wall of said upper casing.

4,411,413

APPARATUS FOR SHORING DURING THE MANUFACTURE OF A REEFER CONTAINER

Robert B. Reidenbach, Honeybrook, Pa., assignor to The Budd Company, Troy, Mich.

Continuation-in-part of Ser. No. 209,545, Nov. 24, 1980, Pat. No. 4,370,795. This application May 7, 1981, Ser. No. 261,464
Int. Cl.³ B23Q *3/14*
U.S. Cl. 269—48.1 **6 Claims**



1. Apparatus for shoring the interior side walls and interior roof surface of a container, comprising:

(a) a pair of vertically disposed side platens;

(b) a horizontally disposed roof platen;

(c) means for selectively expanding or contracting said pair of side platens in horizontal directions to engage or disengage said interior side walls;

(d) means for selectively expanding or contracting said roof platen in a vertical direction to engage or disengage said interior roof surface;

(e) means connecting top edges of said side platens to the side edges of said roof platen to provide shoring of the interior top areas of said interior sidewalls of said container when said side platens and said roof platen are expanded;

(f) said means for connecting comprise means connected to move horizontally and vertically with said side platens and said roof platen in accordance with movements thereof and expandible shoring means connected to the top edges of said side platens to be guided by said means connected to move horizontally and vertically, and

(g) said expandible shoring means including a plurality of slat members secured to each other.

4,411,414

RADIATOR RECORING FIXTURING AND TOOLS

Richard Desiro, 42995 Ambridge, Northville, Mich. 48167

Filed Jun. 1, 1981, Ser. No. 268,551
Int. Cl.³ B25B *1/00*
U.S. Cl. 269—71 **10 Claims**

1. Fixturing for recoring of either soldered or crimped tank radiators of the type including a header and a tank either soldered or crimped thereto, said fixture comprising:

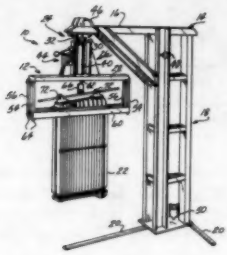
a support frame adapted to be positioned upright on a supporting surface;

clamping fixturing supported suspended from a support frame, said clamping fixturing comprising first and second sets of rails alternately assembled on said support frame for conducting recoring of soldered or crimped tank radiators respectively, each of said sets of rails supported extending parallel to each other when assembled on said support frame for swinging adjustment movement towards and away from each other, each of said pair of rails of said first set being configured with a recess extend-

ing along each of the adjacent side and top rail surfaces to enable said rails to receive radiator headers within each of said recesses of said rails;

each of said adjacent sides and tops of said pair of rails of said second set being squared off and adapted to receive radiator header edges on the top surface thereof, with said rail sides in close proximity to said radiator;

said fixturing further comprising actuator means including a fluid pressure cylinder having an actuator rod extendable,



upon pressurization of said fluid pressure cylinder, downwardly into proximity with radiator tanks disposed on said rails, and further including hold down elements drivingly connected to said actuating rod to engage the upper surfaces of said radiator tank and thereby enable the holding pressure to be exerted thereon by pressurization of said cylinder, said actuating means further comprising means for selectively pressurizing said fluid pressure cylinder to extend said actuating rod.

4,411,415

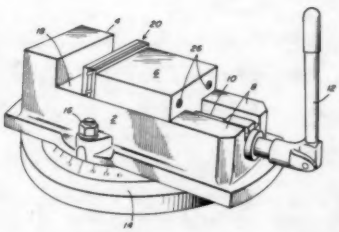
COMPOUND JAW PLATE

James J. Densaro, 543 Bedford St., Concord, Mass. 01742

Filed Jun. 12, 1981, Ser. No. 273,236

Int. Cl.³ B23Q *3/02*

U.S. Cl. 269—134 **3 Claims**



1. A compound jaw plate for applying a bedding force to a workpiece in a vise comprising:

a bed;

a jaw attaching plate;

a work engaging plate spaced from and movable relative to the jaw attaching plate in a direction lengthwise of the bed;

at least two links in pivotal engagement with both the work engaging plate and the jaw attaching plate;

elastomeric material between the work engaging plate and the jaw attaching plate;

the links being positioned at acute angles relative to the intended direction of applied force and downwardly toward the bed for gripping a workpiece;

the links are of equal length and positioned non-parallel to each other, the links closest to the bed being inclined at a greater angle relative to the bed than the links farther from the bed;

whereby, a surface on the work engaging plate which was initially parallel to a surface on the vise attaching plate will move out of parallelism during their relative movement toward each other to induce a greater relative force during movement to the part of the workpiece farther from the bed than to the part closer to the bed.

4,411,416

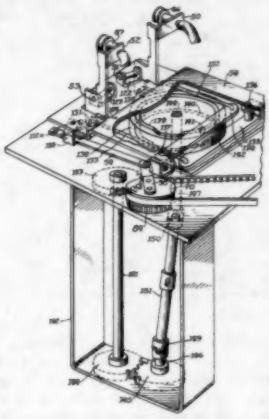
VACUUM DOCUMENT FEEDER

Jerry J. Kosner, La Grange, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Nov. 16, 1981, Ser. No. 322,111

Int. Cl.³ B65H *3/08*

U.S. Cl. 271—11 **10 Claims**



1. A vacuum document feeder system comprising:

means for delivering documents from a stack to a document pick up location at one end of the stack,

at least two documents seizing vacuum cups for engaging and removing a document from the one end of the stack,

one of the cups being a leading vacuum cup which engages the document adjacent one edge of the document, and the other cup being a following vacuum cup spaced apart from the leading vacuum cup, the vacuum cups pivotally mounted on a support means to provide the vacuum cups with a pivoting motion toward and away from the one end of the stack,

a first cam with a first cam surface and first follower means operatively connected to the leading vacuum cup to cause the leading vacuum cup to pivot toward and away from the one end of the stack at the same time during each cycle,

a second cam and second follower means operatively connected to the following vacuum cup, the second follower capable of following either a second or third cam surface on the second cam, the second cam surface being identical to the first cam surface and causing the following vacuum cup to pivot away from the one end of the stack at the same time as the leading vacuum cup and the third cam surface permitting the second follower means to allow the following vacuum cup to remain pivoted toward the stack for a time delayed period with respect to the pivoting away from the stack of the leading vacuum cup,

a drive means to provide power to the support means, cams and follower means to cause the support means and vacuum cups to cyclically move toward and away from the one end of the stack in substantially a perpendicular direction relative to the face of the document,

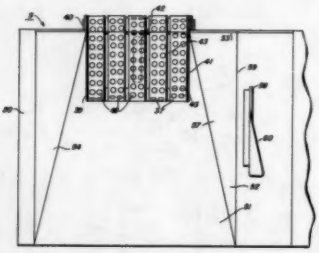
the rigidity of the documents being withdrawn determining the cam surface on the second cam which the second follower will follow with the following vacuum cup pivoting away from the stack in unison with the leading vacuum cup when rigid documents are withdrawn and remaining pivoted toward the stack for the time delayed period when thin, flexible documents are withdrawn resulting in an edge of the document being peeled away from the next adjacent document in the stack when thin documents are withdrawn.

4,411,417

BOTTOM SHEET FEEDING APPARATUS

John M. Browne, Victor, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 2, 1981, Ser. No. 317,212
Int. Cl.³ B65H 3/12
U.S. Cl. 271—94 **11 Claims**



1. A bottom sheet feeding apparatus for separating the bottommost sheet in a stack of sheets and feeding it in a forward direction comprising a bottom sheet separator feeder and a sheet stacking tray having a planar base portion defining a base plane, the front of said base portion having an opening within which said bottom sheet separator feeder may be positioned to feed the bottommost sheet of a stack of sheets when sheets are in said sheet stacking tray, said sheet stacking tray further comprising two sloping planar side wings, one at each side of said opening in said base portion, said sloping planar side wings being angled upward from the base plane and being angled outward from front to rear of said tray, and each sloping planar side wing intersecting said base plane along a line from a point of the rear of the base in the approximate location of the rear corners of a rectangle the size of a sheet to be fed to a point at the front of the tray approximately midway between the front corners of a sheet to be fed and the centerline of a sheet to be fed.

4,411,418

DOCUMENT CORNER REGISTRATION

Raymond E. Poehlein, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 12, 1982, Ser. No. 348,128
Int. Cl.³ B65H 9/00
U.S. Cl. 271—236 **10 Claims**

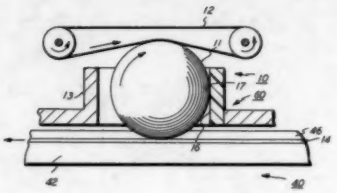
1. In an apparatus for driving a sheet into a corner registration with registration means defining two orthogonal registration lines, including a sphere mounted to overly and engage a sheet being so registered, said sphere being rotatable on variable axes and vertically movable relative to the sheet, the improvement comprising:

drive means engaging said sphere for rotatably driving said sphere in an initial direction of rotation towards both said orthogonal registration lines,

said sphere being adapted to drive a sheet with the driving force applied to said sphere by said drive means,

said drive means engagement providing lateral movement of said sphere relative to said driving means and changes in the direction of rotation of said sphere relative to said initial direction of rotation,

retainer means providing for limited variable lateral movement of said sphere thereagainst in response to the driving force from said drive means and to a reaction force on said sphere from a sheet being driven by said sphere,



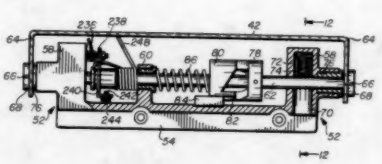
and normal force control means associated with said retainer means for varying the normal force between said sphere and a sheet being driven by said sphere in response to said lateral movement of said sphere and said reaction force.

4,411,419

ARTICULATE BRIDGE ASSEMBLY

Harold Silverman, Norwalk, and Alan B. Hotchkiss, Westport, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 11, 1980, Ser. No. 185,855
Int. Cl.³ B65H 7/12, 5/02
U.S. Cl. 271—263 **8 Claims**



1. In an articulate bridge assembly adapted to overlie an enclosure transport pathway of an envelope inserter having a frame, wherein the bridge assembly comprises a carriage, the carriage including biasing means for engaging the upper surface of successive enclosures traversing the pathway, the bridge assembly including hinge means interconnecting the bridge assembly and the frame, the hinge means extending along an axis parallel to the direction of enclosure transport and the hinge means including means for counterbalancing the weight of the bridge, whereby the bridge assembly may be pivoted about the hinge means from an operative position to open the enclosure transport pathway for servicing and adjustment, an improvement in the counterbalancing means, said improvement comprising:

(a) a pair of cams in mutual engagement,

(b) means fixing one of the cams for rotation unitarily with the bridge assembly,

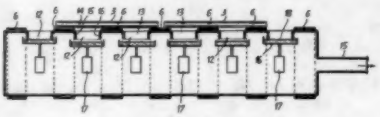
(c) means fixing the other cam against rotation, and

(d) resilient means biasing the cams against one another.

4,411,420
CONVEYOR APPARATUS FOR THE TRANSPORTATION OF PLATES, STRIPS OR SHEETS OF MATERIAL ON CONTINUOUS BELTS

Jacques Louis, Bedarrides, and Jean Gauthier, Soissons, both of France, assignors to La Rochette-Cenpa, Paris, France

Filed Feb. 23, 1981, Ser. No. 236,975
Claims priority, application France, Feb. 27, 1980, 80 04312
Int. Cl.³ B65H 5/02
U.S. Cl. 271—276 4 Claims



1. Apparatus for conveying pieces of material of various widths on a belt in a first direction, said widths being oriented in a direction transverse to said first direction, comprising:

a plurality of substantially parallel endless impervious belts extending over a hollow casing and including openings in the form of slits into the interior of said casing, said slits being coextensive with and extending along and between adjacent belts and having a width slightly less than the spacing between said belts;

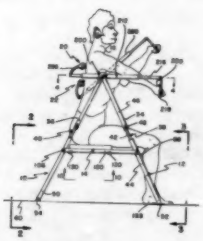
means for inducing negative pressure within the interior of said casing; and

a plurality of shutters mounted within said casing said shutters being associated with a slit and being coextensive therewith and adapted to open and close said associated slit, whereby the number of open slits is selected according to the width dimension of the material conveyed by said belts to conserve said negative pressure.

4,411,421
THERAPEUTIC APPARATUS

Vilas D. Hershberger, R.R. #1, Hesston, Kans. 67062

Filed Sep. 21, 1981, Ser. No. 303,931
Int. Cl.³ A63B 21/00
U.S. Cl. 272—73 17 Claims

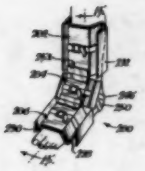


1. Therapeutic apparatus comprising a frame, a pair of laterally spaced guide means pivotally mounted on the frame for vertical swinging movement about aligned horizontal axes, an elongated element operatively associated with each of said guide means to be guided by the latter for longitudinal reciprocation relative thereto, each of said operating elements having forward and rear ends with a handle fixed to the forward end, and each of said operating elements being provided at its rear end with a back massaging means that is laterally offset toward the other operating element, whereby a forwardly facing user positioned between the laterally spaced guide means can manipulate the handles to cause the massaging means to contact his back with a manually controllable force while moving upwardly and downwardly thereagainst.

4,411,422
AQUATIC EXERCISE ASSEMBLY

Daniel S. Solloway, 1315 18th St., Woodward, Okla. 73801

Continuation-in-part of Ser. No. 79,966, Sep. 28, 1979, Pat. No. 4,311,306. This application Oct. 26, 1981, Ser. No. 314,690
Int. Cl.³ A63B 23/04, 31/11
U.S. Cl. 272—96 10 Claims



1. An aquatic exercise assembly for use in water to strengthen muscles, improve muscle tone and enhance muscular coordination, comprising:

an aquatic boot having a leg section for fitting over and generally conforming to the front portion of a lower leg, an ankle section for fitting over and generally conforming to the curved top portion of an ankle, and a foot section for fitting over and generally conforming to a top portion of a foot;

each of said sections having a water-engageable deflector with a water resistant front face and a pair of inner fins extending rearwardly from said front face, an internal pad positioned adjacent said deflector, and a strap for detachably securing said section to said leg, ankle or foot, respectively;

outer fins secured to and extending laterally outwardly from and cooperating with said inner fins of said leg section and said foot section to define forwardly facing, generally V-shaped pockets therewith for cuppingly and resistively engaging the water as said aquatic boot is moved in a forward direction through the water;

each of said fins and said front face being substantially imperforate and water impervious to define water resistive impingement surfaces for hydrodynamically deflecting water and creating a pressure head and fluid resistance to water flow as said aquatic boot is moved through the water; and

each of said fins being positioned an effective distance from said front face for exerting a hydrodynamic torque on said front face and leg to strengthen the muscles of the leg, ankle and foot as said aquatic boot is moved through the water.

4,411,423
EXERCISE DEVICE AND EXERCISE ADAPTER FOR FORMING SAME

Joseph J. Estwanik, III, 1925 Clematis Dr., Charlotte, N.C. 28211

Filed Mar. 29, 1982, Ser. No. 363,036
Int. Cl.³ A63B 21/00
U.S. Cl. 272—117 5 Claims

1. An exercise device for use by a person in exercising of one's upper extremities, said device comprising

(a) an elongate relatively narrow pliable member;

(b) handle means around which said narrow pliable member is adapted to be wound;

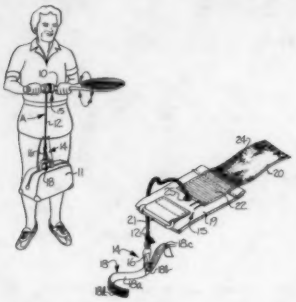
(c) weight means connected to one end of said elongate pliable member; and

(d) means connected to the other end of said elongate pliable member and securing the same to said handle means and comprising

(1) a relatively wide flexible band wrapped around the circumference of said handle means and on and around which band said narrow pliable member is wound during use of the exercise device, and

(2) means carried by and cooperating with said flexible band

for releasably securing the same in surrounding relation to said handle means whereby upon rotational movement of the handle means in one direction, the elongate pliable member is wound in wrapping relation on and around the flexible band in aiding in further securement of the flexible



band to the handle means, and upon rotational movement of the handle means in the opposite direction the wound narrow pliable member is unwound and lowered relative to the handle means thus imparting the desired exercise to the upper extremities of the person.

4,411,424

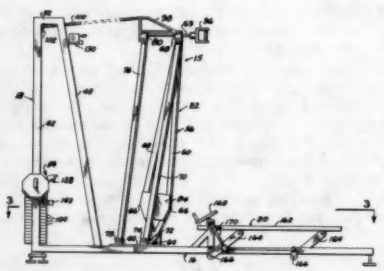
WEIGHT LIFTING EXERCISE APPARATUS

Robert V. Barnett, 904½ N.W. 91, Oklahoma City, Okla. 73114

Filed Feb. 8, 1982, Ser. No. 346,473

Int. Cl.³ A63B *21/12*

U.S. Cl. 272—118 **6 Claims**



1. A weight raising exercise device, comprising:

horizontal base frame means;

upstanding end frame means at one end of the base frame means;

superposed weight means including a plurality of horizontal vertically bored weights supported by said base frame means for vertical sliding movement within said end frame means;

two separate hand grip equipped laterally spaced upstanding lever means pivotally supported by said base frame means intermediate its ends for movement of their upper end portions toward and away from said end frame means;

fulcrum axle means mounted on said base frame means and pivotally connected with the depending end portion of said lever means for pivoting one said lever means away from said end frame means when the other said lever means is pivoted toward said end frame means and vice versa;

flexible elements secured to the respective upper limit of said lever means and entrained through the bores in said weights and over pulley-like means mounted on respective upper and lower end portions of said end frame means; and,

solenoid means connected with a source of electrical energy and mounted on said weight means for connecting at least one said weight with respective intermediate portions of said flexible elements when said lever means are respectively pivoted a predetermined distance toward said end frame means.

4,411,425

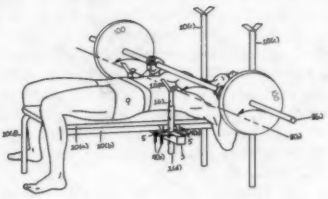
BENCH PRESS SAFETY REST

James B. Milnar, 30255 Champine, St. Clair Shores, Mich. 48082

Continuation of Ser. No. 98,113, Nov. 28, 1979, abandoned. This application Nov. 30, 1981, Ser. No. 326,115

Int. Cl.³ A63B *13/00*

U.S. Cl. 272—123 **7 Claims**



1. A bench press safety rest for use with a weight lifting bench having a seat section with anterior and posterior ends and main barbell support members located immediately adjacent to said anterior end of the seat section, the improvement comprising:

first and second bar supporting members having a height substantially less than the height of the main barbell support members, said first and second bar supporting members being spaced a substantial distance along and toward said posterior end of said seat section from said main barbell support members for supporting a barbell immediately above the chest area of a person occupying a weight lifting bench; and

means adapted for attaching said first and second bar supporting members to opposite sides of said seat section of the weight lifting bench said, attaching means including:

a horizontal member attachable to said seat section of said weight lifting bench; and

means for attaching said first and second bar supporting members to said horizontal member such that said horizontal member supports said first and second bar supporting members along said seat section of said weight lifting bench.

4,411,426

MULTI-PURPOSE EXERCISE IMPLEMENT

Kenneth H. McCoy, Santa Monica, Calif., and John Romain, 1629 Veteran, Los Angeles, Calif. 90074, assignors to John Romain, Los Angeles, Calif.

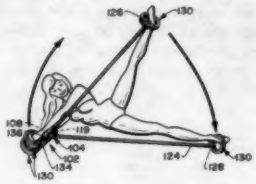
Continuation-in-part of Ser. No. 145,424, May 1, 1980, abandoned. This application Jun. 29, 1981, Ser. No. 278,637

Int. Cl.³ A63B *21/00*

U.S. Cl. 272—126 **9 Claims**

1. A multi-purpose exercise implement comprising a pair of flexible hand lines having annular handles at opposite ends; a single double pulley having non-aligned pulley axes for the respective pulleys, the pulleys being of equal size and being mounted in side-by-side relationship and being wholly con-

tained within an annular sheave-like member having round outer walls and an interior rigid separator to maintain said



hand lines in separated position, said hand lines respectively passing over respective of said pulleys.

4,411,427

BAT FOR PLAYING GAMES

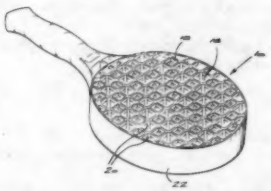
Alfred Baumgartner, Rainstrasse 10, 8590 Romanshorn, Switzerland

Filed Jun. 19, 1981, Ser. No. 275,283

Claims priority, application United Kingdom, Jun. 23, 1980, 8020545

Int. Cl.³ A63B 51/02

U.S. Cl. 273—67 R **3 Claims**



1. A bat for games including a handle and a head, the head including a monolithic unstressed perforated structure characterised by having a pair of spaced apart lattices, each comprised of a plurality of intersecting laths, the two outer surfaces of said lattices constituting the striking surfaces of the bat, the inner surfaces of said lattices being interconnected by a plurality of discrete struts spanning corresponding intersections only of the laths comprising said lattices.

4,411,428

REPOSITIONING MECHANISM FOR GAME REELS

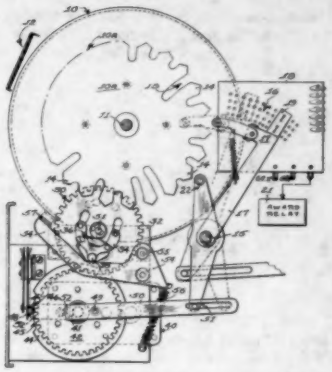
Frank G. Nicolaus, Chicago, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.

Filed Mar. 29, 1978, Ser. No. 891,310

Int. Cl.³ A63F 5/04

U.S. Cl. 273—143 R **10 Claims**

1. Reel-repositioning mechanism for use in spinning reel games having a symbol-bearing reel with co-rotatable code disc means and indexing means acting on the disc means to stop the reel in display positions, said mechanism comprising: a stepping gear; motor means operative to rotate said gear; control circuit means operative to initiate and terminate duty cycle operation of said motor means to turn said stepping gear through a uniform angular distance constituting a duty cycle; disc-drive means rotatable with said gear in driving juxtaposition with said disc means to exert a repositioning force on the disc means by transient engagement therewith in each said duty cycle whereby to step the reel the angular distance necessary to change the symbol which was on display prior to initiation of such duty cycle to display an adjacent symbol.



4,411,429

OFFSET PUTTER

John W. Drew, RR #2 Denmark Rd., and Joe M. Swift, 1227 N. Walnut, both of Danville, Ill. 61832

Filed Dec. 18, 1981, Ser. No. 332,247

Int. Cl.³ A63B 53/04, 53/02

U.S. Cl. 273—164 **11 Claims**

1. An offset golf putter comprising a shaft portion, an offset portion and a head, said shaft having a grip portion and an elongated shank, said offset portion having an upstanding portion, an intermediate portion and a downward portion, said head having an upper surface, a downwardly depending forward face, a downwardly depending rearward face, a lower face, an outer end portion and an inner end portion, when said golf putter is in an operable position said grip portion is attached to the upper end of the shank, said upstanding portion having one end attached to the lower end of the shank, said upstanding portion terminates at the other end at said intermediate portion which extends substantially horizontally and vertically from said upstanding portion, said intermediate portion terminates at said downward portion which extends substantially downwardly from said intermediate portion, said downward portion terminates at said upper surface and is affixed to said head proximate said outer end, said upper surface is substantially horizontal, whereby when said golf putter is positioned said outer end of the putter is positioned furthermost from a golfer's body so that the shaft passes in front of said head in a plane substantially parallel to the head, thereby, when viewed by a golfer the ball is positioned adjacent said downwardly depending forward face of the head, said intermediate portion of the offset portion and said shaft.

4,411,430

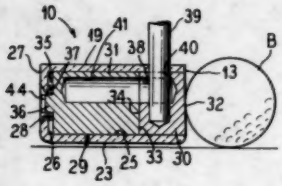
GOLF PUTTER

Walter Dian, Downers Grove, Ill., assignor to Walter Dian, Inc., Downers Grove, Ill.

Continuation-in-part of Ser. No. 151,373, May 19, 1980, Pat. No. 4,324,404. This application Jan. 12, 1982, Ser. No. 338,889

Int. Cl.³ A63B *53/08*

U.S. Cl. 273—171 **11 Claims**



1. In a golf putter having a shaft and a head secured on the end of the shaft with an upstanding front ball impacting face and front-to-rear elongated central axis of mass with a front end providing a sweet spot area on said face, the improvement of an eccentric weight rotatably mounted in said head on said axis to shift the mass for providing a personalized feel to the golfer facilitating impacting of the ball on a sweet spot in said area which will propel the ball on the desired putting line.

4,411,431

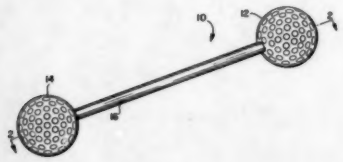
GOLF PUTTING PRACTICE DEVICE

Clay Judice, Lafayette, La., assignor to Strokee Enterprises, Lafayette, La.

Filed Apr. 27, 1982, Ser. No. 372,301

Int. Cl.³ A63B *69/36*

U.S. Cl. 273—183 C **12 Claims**



1. A golf putting device, comprising: a pair of spherical-shaped ball members connected in spaced relationship by a rigid rod member which is aligned between the centers of said ball members, said rigid rod providing for no relative movement between components during a conventional putting stroke, each of said ball members being approximately the size of a standard golf ball; said rod member being of a length of 6 to 10 inches so as to be of sufficient length to allow the rod to serve as a means of alignment of the device between a golf putter and an intended target; at least one of the ball members having the compression characteristics of a standard golf ball; and with the total weight of the device being approximately equal to the weight of a standard golf ball.

4,411,432

TRAVEL GAME

Richard L. Stevens, 301 Harrington, Gower, Mo. 64454

Filed Aug. 10, 1981, Ser. No. 291,566

Int. Cl.³ A63F *3/00*

U.S. Cl. 273—251 **10 Claims**

1. A travel game of skill and chance for at least two players comprising:

a game board displaying a geographical area with a plurality of locations linked by travel routes, each route being marked with a travel distance between the two locations linked by the route;

a plurality of position pieces, one for each player, representing travel vehicles for moving along the travel routes beginning at a designated location of origin and passing from location to location to a designated location of destination, the object of the game being to choose a path along the travel routes so as to be the first to arrive at the location of destination;

a plurality of mileage tokens each bearing only a single-digit number and being obtained by the players by chance, each player combining his single-digit number tokens in groups to form combination numbers equal to the travel distances marked on the routes of his chosen path and expending the groups of tokens for the right to move his position piece along those routes; and

chance number indicator means for use by the players in turn for acquiring the numbered tokens.

4,411,433

BOARD GAME APPARATUS

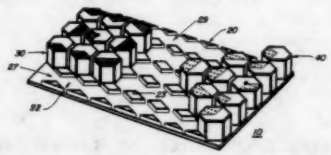
William M. Flynn, Boise, Id., assignor to The Gametree Company, Boise, Id.

Continuation-in-part of Ser. No. 951,350, Oct. 16, 1978, Pat. No. 4,305,585. This application Oct. 1, 1981, Ser. No. 307,584

The portion of the term of this patent subsequent to Dec. 15, 1998, has been disclaimed.

Int. Cl.³ A63F *3/02*

U.S. Cl. 273—260 **2 Claims**



1. Apparatus for playing a game comprising:

a game board formed with a plurality of contiguous and aligned playing spaces; said board being rectangular in shape and having a grid defining five files and eight ranks of hexagonal playing spaces; and

two sets of playing pieces simultaneously placeable on said game board in an adversary relationship; each playing piece of each set adapted to be placed in and selectively rotated within selected playing spaces; each of said sets having nine hexagonal playing pieces; each piece of each set having indicia identifying membership to that set; and each set having five playing pieces having indicia indicating two sides invulnerable from attack and four pieces

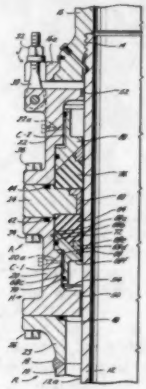
having indicia indicating three sides invulnerable from attack.

4,411,434

FLUID SEALING ASSEMBLY FOR A MARINE RISER TELESCOPIC SLIP JOINT

George E. Lewis, Los Angeles, Calif., assignor to Hydril Company, Los Angeles, Calif.

Filed May 24, 1982, Ser. No. 381,009
Int. Cl.³ F16J 15/48; F16L 17/00
U.S. Cl. 277—27 5 Claims



1. A fluid sealing apparatus adapted for use in a slip joint of a marine riser, the slip joint having relative reciprocating inner and outer tubular members which form a portion of the contained fluid flow path provided by the marine riser and which telescopically move relative to the other member to compensate for variations in effective riser length, said fluid sealing apparatus, including:

a seal housing adapted to be secured to one of the tubular members for operably positioning said seal housing relative to the other of the tubular members, said housing have an annular recess disposed adjacent the other of the tubular members;

a resiliently deformable packing disposed in said annular recess for forming a desired fluid seal between said seal housing and the other of the tubular members to prevent undesired leakage of fluid therebetween;

a packing follower movably disposed in said annular recess for urging said packing to operably deform to effect the desired fluid seal, said packing follower responsive to a prearranged fluid pressure urging thereon to urge said packing to operably deform for effecting the desired seal;

said seal housing concentrically surrounding the other tubular members for enabling relative movement therebetween when secured and to one of the tubular members to juxtapose said annular recess and the other tubular member;

said packing follower having substantially a sleeve shape for positioning in said annular recess while concentrically surrounding the other tubular member, said packing follower slidably disposed in said annular recess for movement to operably deform said packing;

said sleeve-shaped packing follower having an outer surface formed by a first constant diameter portion and a second constant diameter portion, said first diameter portion having a greater diameter than said second diameter portion;

a first seal means for slidably sealing said first constant diameter portion to said seal housing; and

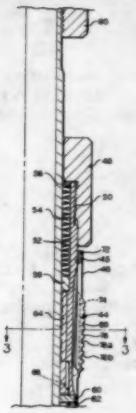
second seal means for slidably sealing said second constant diameter portion to said seal housing, said first seal means and said second seal means partially defining an enclosed expansible chamber for urging said packing follower to operably deform said packing in response to the fluid pressure in said enclosed expansible chamber.

4,411,435

SEAL ASSEMBLY WITH ENERGIZING MECHANISM

David M. McStravick, Houston, Tex., assignor to Baker International Corporation, Orange, Calif.

Filed Jun. 15, 1981, Ser. No. 273,514
Int. Cl.³ F16J 15/18
U.S. Cl. 277—9.5 16 Claims



1. An expansion joint positionable with a subterranean well between upper and lower conduit member secured thereto, comprising: a plurality of telescoping members, including an outer annular housing, and an inner annular mandrel; a nonelastomeric annular sealing member in sealing contact with the outside annular surface of said mandrel and the inside annular surface of said housing; energizing means exerting an axially compressive force on said sealing member; first means for releasably attaching the seal assembly to the mandrel; second means for attaching the seal assembly to the housing and for actuating the energizing means, the mandrel being movable axially relative to the seal assembly with the energizing means biasing the seal assembly relative to the housing, whereby a dynamic seal is maintained relative to the mandrel and a static seal being maintained relative to the housing.

4,411,436

SPRING LOADED PISTON SEAL ASSEMBLY

Peter Durenec, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

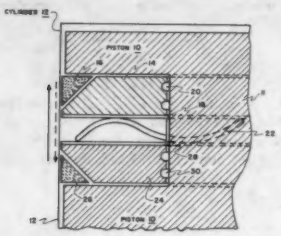
Filed Apr. 5, 1982, Ser. No. 365,219
Int. Cl.³ F16J 9/06, 9/22
U.S. Cl. 277—53 19 Claims

1. A spring loaded piston seal assembly comprising:

a plurality of annular grooves around the upper portion of said piston;

a dry seal means within each of said plurality of annular grooves comprised of two resting rings having at least one beveled edge on the outer periphery and a labyrinth seal on its annular seating region which fits into the base of said plurality of annular grooves and having a free-float-

ing sealing wedge form fitted into each of the beveled edges for sliding along a cylinder wall; and



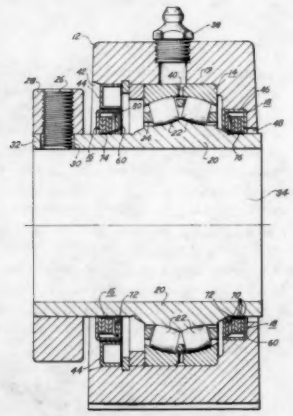
a spring biasing means positioned between said two resting rings which biases said two resting rings against the upper and lower shoulders of said plurality of annular grooves.

4,411,437

SEAL WITH FACE-TO-FACE FLAT METAL SEALING WASHERS

Roger C. Conti, Simpsonville, S.C., assignor to Reliance Electric Company, Greenville, S.C.

Filed Jul. 14, 1982, Ser. No. 398,105
Int. Cl.³ F16J 15/28
U.S. Cl. 277—53 **7 Claims**



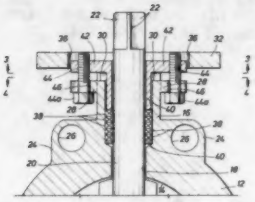
1. A clearance seal for use with pillow blocks or similar devices having a bearing with an inner race and/or other rotatable element, comprising an annular housing of U-shaped cross sectional configuration with an annular peripheral wall and spaced, radially extending side walls joined to said peripheral wall, a plurality of flat metal sealing washers in face-to-face contact disposed in said housing, all having an outside diameter smaller than the diameter of the inner side of said peripheral wall of the housing and normally being spaced from said inner side and moveable radially relative to one another to adjust for misalignment of the shaft, and a resilient washer disposed in said housing and seated against said washers for urging one of said sealing washers into contact with the internal surface of one of said side walls.

4,411,438

PACKING GLAND

William B. Scobie, Houston, Tex., assignor to Keystone International, Inc., Houston, Tex.

Filed Apr. 16, 1981, Ser. No. 254,958
Int. Cl.³ F16J 15/18
U.S. Cl. 277—105 **21 Claims**



1. A stuffing box assembly comprising:
housing means including
a main body portion,
a generally tubular neck portion extending outwardly from said main body portion,
said housing means having a bore extending through said neck portion and the adjacent part of said main body portion,
and housing flange means extending laterally outwardly from said neck portion and longitudinally spaced along said neck portion from said main body portion;
a shaft received in said bore for movement with respect to said housing means;
annular seal means within said bore surrounding said shaft;
gland means comprising
compression means disposed at least partially within said bore adjacent one end of said seal means,
and gland flange means adjoining said compression means and extending laterally outwardly therefrom generally parallel to said housing flange means externally of said bore,
said gland means being movable in a first longitudinal direction toward said seal means to compress said seal means;
an adjusting screw disposed generally parallel to said shaft, threadedly connected to said gland flange means, and rotatably but non-threadedly received in said housing flange means, and having an engagement portion disposed externally of said housing means and said gland means and longitudinally between said housing flange means and said main body portion, said engagement portion being engageable to rotate said adjusting screw;
and stop means cooperative between said adjusting screw and said housing means to limit movement of said adjusting screw in a second longitudinal direction opposite to said first direction.

4,411,439

SEALING MEMBER WITH ANTI-EXTRUSION MEANS AND PROTECTIVE COATING

Paul L. Couvillion, and James E. Ray, both of Houston, Tex., assignors to Jim Ray Company, Inc., Houston, Tex.

Filed Apr. 28, 1982, Ser. No. 372,487
Int. Cl.³ F16J 15/18, 15/46
U.S. Cl. 277—188 A **10 Claims**

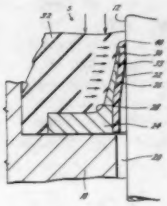
1. A sealing member for forming a seal against pressure differentials between a body member and a movable member mounted within the body member in a space formed in the body member adjacent a surface of the body member through which the movable member passes, said sealing member comprising:

(a) a lower shoulder member having a contact surface for

insertion into the annular space to engage the surface of the body member in the body member;

(b) a cylindrical anti-extrusion member extending upwardly from said lower shoulder member and having a contact surface adapted for engaging the movable member;

(c) said shoulder member and cylindrical anti-extrusion member having sealing elastomer means mounted there-



with for transmitting pressure thereto to cause said contact surface of said cylindrical anti-extrusion member to move into sealing engagement with said movable member to prevent movement of said sealing elastomer into said space; and

(d) a coating of low-friction material formed along said contact surface of said cylindrical anti-extrusion member to protect against galling of the movable member.

4,411,440

SWINGING CHUCK FOR TURNING MACHINES

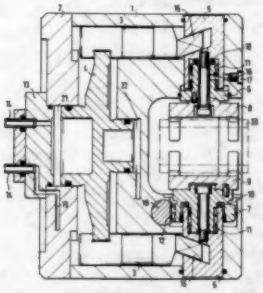
Wolfgang Becker, Grossbettlingen, Fed. Rep. of Germany, assignor to Wilhelm Blessing, Nellingen, Fed. Rep. of Germany

Continuation of Ser. No. 114,738, Jan. 24, 1980, abandoned. This application Apr. 19, 1982, Ser. No. 369,657

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1979, 2902421

Int. Cl.³ B23B *31/18*

U.S. Cl. 279—5 **22 Claims**



1. A work piece gripping chuck for use on turning machines, comprising:

a. a cup-shaped body having a continuous cylindrical periphery wherein said body is adapted to be mounted on and for co-rotation with a machine spindle and wherein said body includes a pair of diametrically opposed radial bores;

b. a pair of diametrically opposed, radially extending clamping jaws mounted in said body for radial reciprocation towards and away from each other as a means for gripping and releasing a work piece and wherein each of said jaws includes a cylindrical jaw pin slideably guided in said radial bores;

c. a clamping plate centrally positioned in said chuck body and guided for axial translational movement;

d. a pair of parallel accuating bars axially reciprocal in said body and connected to said plate;

e. means for coupling each of said accuating bars to a respective clamping jaw and means for converting common horizontal movement of said accuating bars into radial movement of said jaws, wherein said coupling means and said converting means engage each of said jaw pins respectively intermediate of their end portions guided in said radial bores, and wherein further each of said clamping jaws further comprises jaw bases including a central spindle portion rotatably mounted within a hollow radial inner end of each of said jaw pins respectively; and,

f. drive means for rotating said clamping jaws about an axis of radial reciprocation and means for locking said drive means in position wherein said jaw bases have a peripheral portion surrounding said radial inner end of said jaw pins respectively and in driving engagement with said rotating means.

4,411,441

MOUNTING FOR A FUEL TANK OF SYNTHETIC MATERIAL

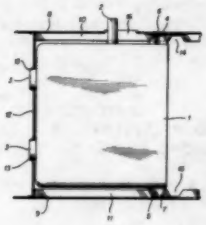
Raymond Marcheix, Paris, and Christian Desiage, Rueil Malmaison, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Jun. 8, 1981, Ser. No. 271,129

Claims priority, application France, Jun. 6, 1980, 80 12623

Int. Cl.³ B60K *15/02*

U.S. Cl. 280—5 A **6 Claims**



1. A mounting assembly for a fuel tank, having a nozzle extending therefrom, of synthetic material for automobiles comprising:

a first and second L-shaped side rail each including a horizontal end portion, said first side rail having an opening formed therein within which said nozzle is positioned;

a cross member interconnecting said first and second L-shaped side rails and having at least one opening formed therein;

at least one protuberance extending from a front face portion of said tank cooperatively engaging said at least one opening formed in said cross member; and

first and second ... ral attachment lugs connected to said tank cooperatively engaging said horizontal end portions of said first and second L-shaped side rails.

4,411,442

FOOT-POWERED WHEELED VEHICLE

Nolan J. Rills, 836 Mary Ave., Opelousas, La. 70570

Filed Aug. 17, 1981, Ser. No. 293,497

Int. Cl.³ B62M *1/04*

U.S. Cl. 280—221 **6 Claims**

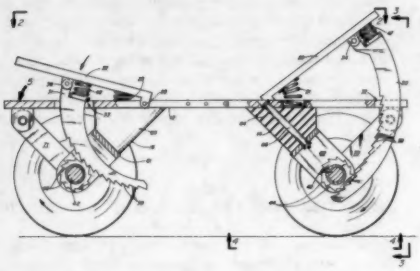
1. A foot-powered, wheeled vehicle comprising:

a. a frame including a platform adapted to accommodate both feet of an operator;

b. a pair of spaced apart front and rear trucks, each truck supporting a shaft and at least two wheels affixed to said

shaft at the outermost end portions thereof and being rotatably mounted with respect to said platform;

c. an independently depressable front and rear foot pedal cooperating with each truck, each pedal being pivotally connected to said frame and movable between upper and lower positions, the forwardmost pedal being connected to the frame so that the free end portion of the pedal faces the front of the vehicle and the rearmost of said pedals being connected to the frame so that the free end portion of that pedal faces the rear of the vehicle;



d. a return spring associated with each of said pedals for independently biasing each of said pedals toward the upper position; and

e. the shaft of each truck and its associated pedal including cooperating gear means for driving the shaft of the associated truck responsive to downward movement of the associated pedal, whereby the vehicle can be propelled by either foot of the operator such as by fore and aft independent foot depression of the operator.

4,411,443

STREAMLINED BICYCLE DESIGN

Christopher A. Pollard, 1060 S. Park Dr., Monument, Colo. 80132

Filed Jun. 13, 1980, Ser. No. 159,214

Int. Cl.³ B62K *3/00*

U.S. Cl. 280—281 LP **9 Claims**

1. A streamlined, two-wheeled bicycle, comprising:

a steerable front wheel assembly including a front wheel;

a rear wheel assembly including a rear wheel;

an elongated frame having a front end to which is connected the front wheel assembly and having a rear end to which is connected the rear wheel assembly;

the frame including means for supporting a rider in a head-forward, recumbent position over the frame;

a pedal assembly located at the rear portion of the frame so that the pedals are engaged by the feet or the rider when in said recumbent position;

means for transmitting power from the pedal assembly to the rear wheel assembly to propel the bicycle;

an elongated pod-shaped, streamlined body attached to the frame and substantially completely enclosing the frame, the pedal assembly and a rider when the rider is in said recumbent position wherein the pod-shaped body is substantially symmetrical about an axis parallel to the direction of movement of the cycle;

the body further having a front section which smoothly expands in diameter, smoothly joining with a middle section which is convex with respect to said axis, and a rear section which is concave with respect to said axis and which tapers substantially to a pointed end;

the body having a maximum diameter of D and being mounted to the frame such that the distance from the ground to said axis is approximately D and wherein the maximum diameter D of the body is approximately 15 percent of the total length of the body;

a front wheel fairing attached to the body and substantially enclosing the front wheel in combination with the body;

a rear wheel fairing attached to the body and substantially enclosing the rear wheel in combination with the body;

the front and rear wheel fairings being separate such that an open space beneath the body and between the front and rear wheel fairings is provided; and

wherein each of the front and wheel fairings are shaped so that horizontal sections thereof are in the form of an elongated, teardrop shape.

4,411,444

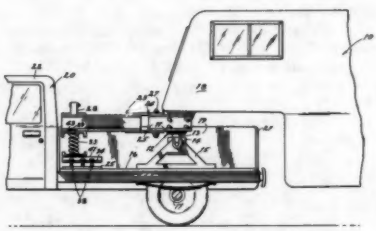
LOAD EQUALIZER

Robert W. Holloway, 471 Almond Dr., No. 6, Lodi, Calif. 95240

Filed Feb. 25, 1982, Ser. No. 352,202

Int. Cl.³ B62D *53/08*

U.S. Cl. 280—405 A **11 Claims**



7. A load equalizer for attachment on a trailer of the type having an elevated gooseneck which partially overlaps the rear bed of a towing truck where the bed is bounded by side and rear panels and a forward cab, the trailer having a bearing plate and kingpin adapted to be connected to a fifth wheel mounted on the truck bed above a truck rear axle, thereby permitting turning movement between them about the kingpin axis;

a rigid arm having a front end and a rear end, said rigid arm being adapted to be operably mounted to a bearing plate for movement about a first upright axis perpendicular to the rigid arm, said rigid arm being further adapted to extend generally forwardly in a substantially horizontal position from the trailer gooseneck to a location adjacent to the cab of a towing truck;

a vertical post slidably mounted by the front end of said rigid arm along a second upright axis parallel to said first upright axis, said post depending downwardly from the front end of the rigid arm to a lower post end;

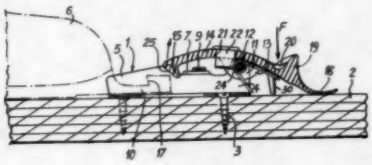
spring means connected between said rigid arm and said post for resisting downward motion of said rigid arm relative to said post along the second vertical axis; and

a pad adapted to be fixedly mounted to the bed of a towing truck in slidable abutting engagement with the lower end of said post at a location adjacent to the cab of the towing truck.

4,411,445
SKI BINDING TO SECURE A SHOE TO A SKI

Armand Kreyenbuhl, Samoens, France, assignor to Adidas Fabrique de Chassures de Sport, Landersheim, France

Filed Jun. 15, 1981, Ser. No. 273,937
Claims priority, application France, Jun. 13, 1980, 80 13271
Int. Cl.³ A63C 9/00
U.S. Cl. 280—615 8 Claims

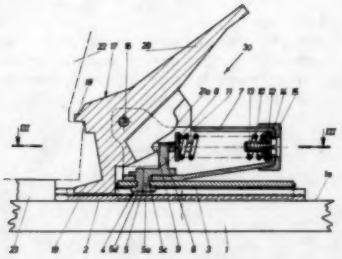


1. In a ski binding for fastening a boot to a ski, especially a cross-country ski or touring ski, said binding being of the type in which the boot is secured to the ski by an extension of the sole located at the front of the boot which engages in an archplate connected to the ski which delimits a space whose shape corresponds in width and height to that of the extension of the sole, locking means for locking the sole extension in the archplate against rearward withdrawal of the extension from the archplate, said locking means comprising, a latch, means connecting said latch to said archplate for pivotal movement about a horizontal axis transverse to the length of the ski, from a locking position in which the latch engages a cooperating surface of the sole extension to prevent rearward withdrawal of the sole extension from the archplate, to an unlocking position in which the latch is disengaged from the sole extension and can be withdrawn from the archplate, said latch comprising a front portion having a flexible extension which engages the ski at a location in front of the horizontal axis of pivotal movement of the latch in both said locking and unlocking positions of the latch, said latch and its front portion having a streamlined exterior profile axially of the ski to minimize accumulation of snow at the front of the binding, and wherein pivoting said locking means from said locking position to said unlocking position will flex said flexible extension.

4,411,446
RELEASE BINDING

Engelbert Spitaler, Wr. Neudorf, Austria, assignor to TMC Corporation, Baar, Switzerland

Filed Mar. 11, 1981, Ser. No. 242,819
Claims priority, application Austria, Mar. 19, 1980, 1480/80
Int. Cl.³ A63C 9/08
U.S. Cl. 280—628 9 Claims

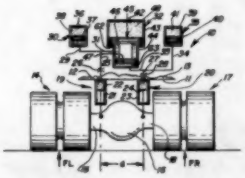


1. In a release binding adapted to be mounted on the upper side of a ski, including a base plate, a swivel element supported on said base plate, a support member supported on said swivel element for pivotal movement about a pivot axis which is substantially normal to the upper side of the ski, a housing having a sole holder thereon and supported on said support member for generally vertical movement between released and downhill skiing positions, first locking means for yieldably resisting upward movement of said housing away from said downhill skiing position, said first locking means including a control surface provided on said housing, a locking member which is supported on said support member for movement in directions generally parallel to the longitudinal axis of said ski in said downhill skiing position and which is engageable with said control surface, and resilient means yieldably urging said locking member toward said control surface, and second locking means for inhibiting pivotal movement of said support member and housing about said pivot axis when said housing is in said downhill skiing position and until said housing thereafter moves upwardly a predetermined distance away from said downhill skiing position, the improvement comprising wherein said second locking means includes a substantially V-shaped notch which is provided on said locking member, extends generally longitudinally of the ski in said downhill skiing position, has at its center a recess having a rounded surface and spaced side surfaces adjacent said rounded surface which extend substantially parallel to the longitudinal axis of the ski in said downhill skiing position, and wherein said second locking means further includes an upright extension on said swivel element which is positioned eccentrically with respect to said pivot axis and has a rounded surface which faces and has a radius substantially equal to that of said rounded surface of said recess of said notch, said locking member being urged toward said extension by said resilient means and said extension engaging said recess in said downhill skiing position.

4,411,447
VEHICLE SUSPENSION SYSTEM

Cullen P. Hart, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 2, 1981, Ser. No. 317,709
Int. Cl.³ B60G 11/26
U.S. Cl. 280—714 14 Claims



1. In a vehicle (10) having a frame (11), left (14) and right (17) wheels carried respectively on left (15) and right (18) portions of an axle (16), a left suspension strut (19) having fluid cylinder means (21) provided with a movable piston means (22), one of said means (21,22) being fixedly associated with said axle left portion (15) and the other of said means being fixedly associated with same frame, and a right suspension strut (20) having fluid cylinder means (23) provided with a movable piston means (24), one of said right strut means being fixedly associated with said axle right portion (18) and the other of said right strut means being fixedly associated with said frame (11), the improvement comprising:

main pressure accumulator means (32,149) having at least one pressure accumulator having first (46,152) and second (47,154) movable piston means (21,22) defining respectively equal area first (62) and second (63) pressure surfaces, and means (45,157) causing joint movement of said piston means and first resilient means (48,160,161) for resisting said joint movement of the piston means;

a left auxiliary pressure accumulator (30) having a third movable piston means (37) and second resilient means (38) for resisting movement of said third piston means;

a right auxiliary pressure accumulator (35) having a fourth movable piston means (40) and third resilient means (41) for resisting movement of said fourth piston means (40);

means (25,29,31,131) for fluidly connecting the left strut cylinder (21) with said main and left auxiliary pressure accumulator (32,149,30) to direct fluid pressure from said left strut cylinder means (21) against said first (46) and third (37) piston means; and

means (27,33,34,133) fluidly connecting the right strut cylinder (23) with said main (43) and right (39) auxiliary pressure accumulator means (32,149,35) to direct fluid pressure from said right strut cylinder means (23) against said second (47) and fourth (40) piston means, the spring rate of said second (38) and third (41) resilient means being greater than the spring rate of said first (48) resilient means.

4,411,448

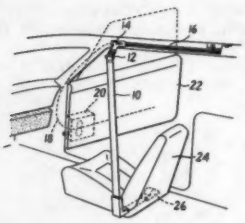
PASSIVE TYPE VEHICLE OCCUPANT RESTRAINT BELT SYSTEM WITH ELECTRICAL BRAKING

Juichiro Takada, 3-12-1, Shinmachi, Setagayaku, Tokyo, Japan

Filed Jun. 17, 1981, Ser. No. 274,533

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—802 **4 Claims**



1. A belt transfer system for transferring a belt guide member of a passive vehicle occupant restraint belt system between a restraint location in which the belt is adapted to engage the occupant and a release location in which the belt is adapted to release the occupant comprising a source of DC electrical power, a reversible DC motor, first circuit means including a first switch for connecting both sides of the motor armature to the power source to brake electrically the motor when the belt guide member reaches the release location at the end of transfer thereto, second circuit means including a second switch for connecting the motor across the power source to energize it for rotation in a direction to transfer the belt guide member from the restraint location to the release location, third circuit means including a third switch for connecting both sides of the motor armature to the power source to brake electrically the motor when the belt transfer member reaches the restraint location at the end of transfer thereto, fourth circuit means including a fourth switch for connecting the motor across the power source to energize it for rotation in a direction to transfer the belt guide member from the release location to the restraint location, and a double-pole, double-throw switch actuated in response to the position of the vehicle door for connecting the first and second switches to the motor when the door is opened and the third and fourth switches to the motor when said door is closed.

4,411,449

CONNECTING MEMBER FOR A DRIVE WIRE CASING IN PASSIVE SEAT BELT SYSTEMS

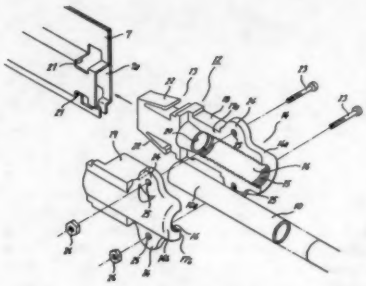
Juichiro Takada, 3-12-1, Shinmachi, Setagayaku, Tokyo, Japan

Filed Jun. 10, 1981, Ser. No. 272,358

Claims priority, application Japan, Jun. 13, 1980, 55-081831[U]

Int. Cl.³ B60R *21/10*

U.S. Cl. 280—804 **8 Claims**



1. In a passive vehicle safety belt system having a transfer member that is moved between restraining and releasing configurations along a guide rail by a drive device that includes a drive wire with an outer casing, a connecting member for joining the guide rail to the outer casing of the drive wire comprising:

first and second parts constituting an elongated retaining portion defining portions of a longitudinally disposed socket having a plurality of closely spaced annular grooves, the parts clamping the outer casing of the drive wire in the socket; and

a clasp portion joined to the retaining portion, disposed in the guide rail, with locking means mating with apertures in the guide rail for releasably locking the retaining portion to the guide rail.

4,411,450

CHROMOGENIC PROPENYLENESULFONE COMPOUNDS

Jean C. Petitpierre, Kaiseraugst, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

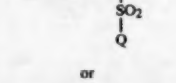
Division of Ser. No. 73,758, Sep. 10, 1979, Pat. No. 4,287,336. This application Apr. 2, 1981, Ser. No. 250,498

Claims priority, application Switzerland, Sep. 22, 1978, 9954/78

Int. Cl.³ B41M *5/16, 5/18, 5/22*

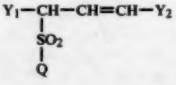
U.S. Cl. 282—27.5 **6 Claims**

1. A pressure-sensitive or heat-sensitive recording material which comprises a support which contains or has coated thereon as color former at least one propenylenesulfone compound of the formula



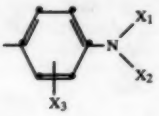
[(1A)]

or



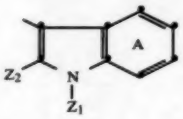
[(1B)]

wherein each of Y_1 and Y_2 independently represent an amino-substituted phenyl radical of the formula

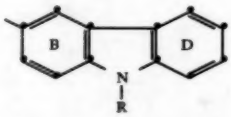


[(1a)]

a 3-indolyl radical of the formula



or a 3-carbazolyl radical of the formula



Q represents alkyl of 1 to 12 carbon atoms or unsubstituted or substituted aryl or aralkyl, each of X_1 and X_2 independently represents hydrogen, alkyl containing not more than 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, or represents cycloalkyl, phenyl, benzyl, or phenyl or benzyl which is substituted by halogen, lower alkyl or lower alkoxy, or X_1 and X_2 together with the nitrogen atom to which they are attached represent a pyrrolidino, piperidino, piperolino, morpholino, thiomorpholino or piperazino group, X_3 represents hydrogen, halogen, nitro, lower alkyl or lower alkoxy, each of R and Z_1 independently represents hydrogen, alkyl containing not more than 12 carbon atoms which is unsubstituted or substituted by halogen, hydroxyl, cyano or lower alkoxy, or represents alkenyl containing not more than 12 carbon atoms, acyl of 1 to 12 carbon atoms, phenyl, benzyl, or phenyl or benzyl which is substituted by halogen, lower alkyl, lower alkoxy or nitro, and Z_2 represents hydrogen, lower alkyl or phenyl, the rings A and B, each independently of the other, are unsubstituted or substituted by cyano, nitro, halogen, lower alkyl, lower alkoxy or lower alkoxycarbonyl, and ring D is unsubstituted or substituted by cyano, nitro, halogen, lower alkyl, lower alkoxy, lower alkoxycarbonyl, unsubstituted or substituted phenyl or a fused benzene ring.

4,411,451

PRESSURE SENSITIVE COPYING PAPER

Toshihiko Matsushita, Funabashi; Sadao Morishita, Ibaraki; Eiko Kamimura, Yoshikawamachi, and Shigetoshi Hiraishi, Tokyo, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Aug. 12, 1981, Ser. No. 292,126
Claims priority, application Japan, Aug. 28, 1980, 55-118845
Int. Cl.³ B41M *5/22*
U.S. Cl. 282—27.5 **2 Claims**

1. A pressure sensitive copying paper comprising a color developer coated sheet obtained by coating a color developer on a support and a color former coated sheet obtained by coating on another support an aqueous coating color constituted mainly of (i) microcapsules containing a substantially colorless color former, (ii) a microcapsule-protecting agent and (iii) a binder selected from the group consisting of hydrophilic polymer colloids, starch, oxidized starch, casein, polyvinyl alcohol, carboxymethyl cellulose, water-soluble or dispersable gums and latexes and drying the coated aqueous coating color, wherein a wax in the form of an aqueous emulsion or aqueous suspension is added to said aqueous coating color in an amount of 3–15% by weight based on the solid content of the coating color.

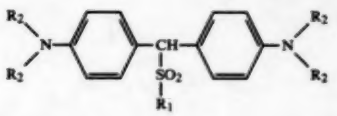
4,411,452

PRESSURE-SENSITIVE RECORDING MATERIAL

Akio Miyamoto, Fujinomiya, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 16, 1982, Ser. No. 368,929
Claims priority, application Japan, Apr. 16, 1981, 56-57593
Int. Cl.³ B41M *5/16, 5/22*
U.S. Cl. 282—27.5 **8 Claims**

1. A pressure-sensitive recording material comprising a base paper having a surface pH of at least 6.0 and having coated thereon microcapsules containing a benzhydrylsulfone type color former solution, wherein the benzhydrylsulfone type color former is represented by the formula (I)



(I)

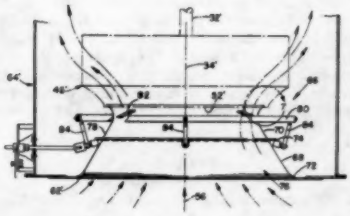
wherein R_1 represents a monovalent group containing from 5 to 25 carbon atoms and R_2 represents a lower alkyl group containing from about 1 to 5 carbon atoms.

4,411,453

FAN OR BLOWER ASSEMBLY

Donald F. Philipps, Coon Rapids, and Richard D. Williamson, Hugo, both of Minn., assignors to The Marley/Wylain Company, Mission Woods, Kans.

Division of Ser. No. 940,121, Sep. 6, 1978, Pat. No. 4,253,769.
This application Sep. 23, 1980, Ser. No. 190,081
Int. Cl.³ F16L *55/00*
U.S. Cl. 285—18 **7 Claims**



1. In combination with an air duct assembly having a first duct formed as a truncated cone-shaped surface of revolution about a principal axis, and a second duct formed as a venturi shaped surface of revolution about said axis, means mounting said second duct in axially shiftable, radially spaced apart, concentric relationship with said first duct, comprising:

a plurality of links operably connecting said first duct and said second duct and maintaining the same radially spaced apart out of surface contacting relationship. each of said links having a first end operably, pivotally connected to said first duct and the opposed ends of said links operably pivotally connected to said second duct; and

means for rotating said second duct about said principal axis relative to said first duct thereby pivoting said links about their pivoting axes to change the effective length of said

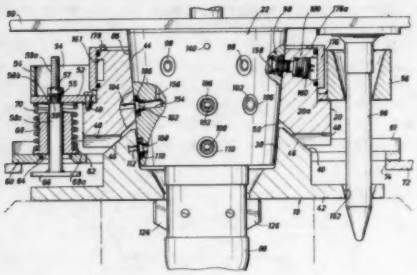
links in the direction of said principal axis for effecting said axial shifting of said second duct without sliding said second duct along the first duct.

4,411,454

UNDERWATER WELLHEAD CONNECTOR

Douglas W. J. Nayler, Kingwood, and John D. Smith, Houston, both of Tex., assignors to NL Industries, Inc., New York, N.Y.

Filed Nov. 3, 1980, Ser. No. 202,942
Int. Cl.³ F16L 35/00
U.S. Cl. 285—26 **29 Claims**



1. Apparatus for connecting to a wellhead structure comprising:

a first female body defining a first receptacle opening generally upwardly;

first guide means connected to said first female body and engagable with said wellhead structure for at least gross positioning of said first female body with respect to said wellhead structure;

a second female body having a bore defining a second receptacle opening generally upwardly and downwardly, and engagable with said first female body with said receptacles in substantial coaxial alignment;

second guide means connected to said second female body and engagable with said wellhead structure for at least gross positioning of said second female body with respect to said wellhead structure;

compensator means interconnecting one of said female bodies with the respective one of said guide means for substantial but limited lateral movement of said one female body with respect to said one guide means; and

fine positioning means cooperative between said female bodies for positioning said female bodies with said receptacles in substantial coaxial alignment.

4,411,455

RISER CONNECTOR

Mark A. Schnatzmeyer, 20 Oakbrook Dr., Lewisville, Tex. 75067

Filed Jul. 31, 1980, Ser. No. 173,987
Int. Cl.³ F16L 37/08
U.S. Cl. 285—39 **26 Claims**

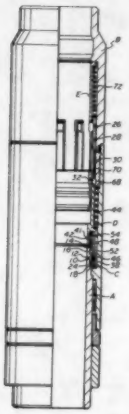
1. A riser connector for connecting a first riser member to a second riser member as the second riser member telescopes over the first riser member comprising

a first connecting means on the first riser member,

a second connecting means on the second riser member wherein the second connecting means can engage the first connecting means thereby connecting the riser members,

a locking sleeve in the bore of the second riser member for controlling the first and second connecting means and movable relative to the second riser member from a first position wherein the first and second connecting means are not in engagement to a second position wherein the first and second connecting means are in engagement, the locking sleeve being activated so as to move from its first to its second position by the telescoping movement of the riser members,

an actuator sleeve movable in the bore of the locking sleeve from a first position to a second position, the direction of movement of the actuator sleeve from its first position to its second position being in a direction opposite the direction of movement of the locking sleeve from its first position to its second position,



means for carrying the actuator sleeve with the locking sleeve as the locking sleeve moves to its second position,

means for preferentially urging the actuator sleeve to its second position, and

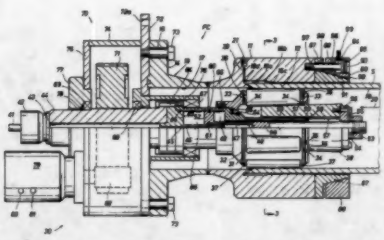
locking means locking the locking sleeve in its second position when the actuator sleeve is in its second position.

4,411,456

APPARATUS, METHODS, AND JOINTS FOR CONNECTING TUBULAR MEMBERS

Charles F. Martin, P.O. Box 197, Porter, Tex. 77365

Continuation of Ser. No. 673,010, Apr. 2, 1976, Pat. No. 4,183,555. This application Jan. 15, 1980, Ser. No. 112,399
The portion of the term of this patent subsequent to Jan. 15, 1997, has been disclaimed.
Int. Cl.³ F16L 35/00
U.S. Cl. 285—39 **25 Claims**



1. An assembly for connecting together tubular bodies to provide a passageway through the connected bodies, comprising:

first and second tubular bodies, each of which includes at least one end portion having an annular end face and an end opening in communication therewith, the bore of the end portion of the second body being greater than the

outside dimensions of the end portion of the first body so that the first body end portion is receivable within the second body end portion to form an overlapping joint area between the said first and second bodies;

indexing means for limiting axially inward movement of the first body end portion into the second body end portion such that said first body annular end face is completely received in said second body end portion;

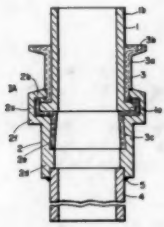
means operatively connected to said first and second bodies and carried by one of said tubular bodies to restrain relative rotational and axial movements of said end portions after said overlapping joint area is formed; and

forging means releasably mounted on one of said tubular bodies and having a rotatable forging head receivable within the bore of said first body end portion for forging the first body end portion laterally outwardly, in the overlapping joint area, into locking engagement with the second body end portion.

4,411,457
INSULATED PIPE JOINT

Takeo Inoue, and Takashi Shirazawa, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1981, Ser. No. 250,789
Claims priority, application Japan, Apr. 14, 1980, 55-51152
Int. Cl.³ F16L *55/00*
U.S. Cl. 285—52 8 Claims



1. An insulated pipe joint comprising:

a first tubular member formed with a flange portion at one end thereof;

a second tubular member having one end thereof formed with a cap portion which accommodates said flange portion of said first tubular member with a gap therebetween;

an insulating member disposed in said gap between said flange portion and said cap portion for hermetically coupling said first and second tubular members and for electrically insulating said first and second tubular members from each other;

said insulating member comprising a glass-mica molding comprising glass and mica powders, said mica powders comprising mica scale particles having planes arranged substantially parallel to walls of said tubular members at portions of said insulating member adjacent said walls.

4,411,458
STEM SECURING MEANS FOR CONDUITS

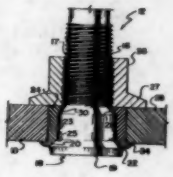
Norman E. Strunk, 401 McMaster Crescent, Saskatoon, Saskatchewan, and Anton P. Poboreski, Box 100, Asquith, Saskatchewan, both of Canada

Filed Apr. 28, 1981, Ser. No. 258,328
Int. Cl.³ F16L *5/02*
U.S. Cl. 285—196 7 Claims

1. An assembly for securing a cylindrical hollow stem to an aperture in the wall of a conduit, said assembly comprising:

(a) a deformable sleeve, said sleeve having an outside diameter just slightly smaller than the diameter of said aperture in the wall of said conduit enabling snug insertion of said sleeve through said aperture, and an internal diameter enabling snug passage of a hollow stem therethrough, said sleeve including an internal chamfered upper end and an external chamfered lower end, the length of said sleeve being greater than the thickness of the wall of said conduit;

(b) a hollow stem, said stem including a frusto-conical bulbous base, provided at the lower end thereof, said bulbous base being of a larger diameter than the external diameter of said hollow stem but being of slightly less diameter than the diameter of said aperture, said base including a first shoulder at the lower end thereof, said first shoulder sloping upwardly and inwardly towards the portion of said stem which is disposed thereabove, and a second frusto-conical shoulder formed thereon spaced above said first frusto-conical shoulder, said second frusto-conical shoulder sloping inwardly and upwardly toward an upper cylindrical stem portion, the diameter of said upper stem portion and said internal diameter of said sleeve being less than the diameter of the stem between said second frusto-



conical shoulder and said first frusto-conical shoulder, a portion of said stem immediately above said second shoulder being screw-threaded; and

(c) clamping means associated with said hollow stem, said clamping means comprising a screw-threaded cylindrical coupling engageable with the portion of said stem above said frusto-conical base which is screw-threaded, the external diameter of the lower end of said cylindrical coupling being greater than the diameter of said aperture; whereby, when said hollow stem and said sleeve are inserted into said aperture, and when said clamping means are actuated to apply a longitudinal upward force against the base of said sleeve, initial actuation of said clamping means forces the lower end of said sleeve over said second frusto-conical shoulder and down to said frusto-conical base, and said sleeve is expanded radially outwardly into sealing engagement with the wall of said aperture, and simultaneously is forced into longitudinally spaced-apart circumferential sealing engagement with said first and second frusto-conical shoulders.

4,411,459
BRANCH FITTING FOR PROVIDING ACCESS TO THE INTERIOR OF A PIPE

Burton Ver Nooy, Tulsa, Okla., assignor to T. D. Williamson, Inc., Tulsa, Okla.

Filed Jun. 29, 1981, Ser. No. 278,642
Int. Cl.³ F16L *41/06, 55/10, 55/18*
U.S. Cl. 285—197 10 Claims

1. A branch fitting for providing access to the interior of a pipe comprising:

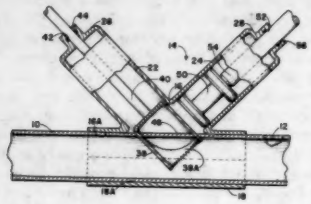
a body portion defined in part by a semi-cylindrical surface adapted to sealably engage a pipe including means to secure the body portion to the pipe in pressure retaining relationship;

a first cylindrical barrel portion extending from said body portion in the plane of the tubular axis of the pipe;

a second cylindrical barrel portion extending from said body portion in the same plane;

means within said first barrel portion for providing an opening in the pipe, the opening providing access between said second barrel portion and the interior of the pipe;

an operating member positionable in said second barrel portion; and



means of moving said operating member from said second barrel through the formed opening into the interior of the pipe.

4,411,460

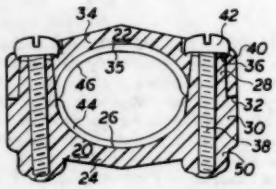
HOSE COUPLING AND CLAMP

Glenn I. Beal, Somerset, Pa., assignor to R. M. Smith, Inc., Somerset, Pa.

Filed Apr. 21, 1981, Ser. No. 256,149

Int. Cl.³ F16L *33/00*

U.S. Cl. 285—243 **11 Claims**



1. A hose clamp system for use with a soft-walled, garden-variety hose, said system comprising:

a hose end member, said member including at one end thereof a portion which is to extend from said hose and at the other end an elongated sleeve portion dimensions to slidingly fit within the end of said hose, said sleeve portion including at least one upraised ridge about its outer surface spaced from said extending end;

a plastic male clamping member having a clamping portion with a first curved inner surface for engaging the outer surface of said hose end into which said sleeve portion is slidingly fit; said first curved inner surface including a first recessed curved portion and a first curved portion upraised relative to said first recessed curved portion, said plastic male clamping member further including spaced, integrally formed plastic chucks that extend out of said clamping portion such that a portion of the surface of said chucks is adjacent the arcuate ends of said first curved inner surface, said plastic chucks including elongated bores extending therethrough and beyond the rear surface of said male clamping member into closed integral plastic mounds thereon;

a plastic female clamping member having a clamping portion with a second curved inner surface for engaging the outer surface of said hose end, said second curved inner surface including a second recessed curved portion and a second curved portion upraised relative to said second recessed curved portion, said plastic female clamping member further including spaced depression areas in registry with said spaced, integrally formed plastic chucks of said male clamping members and shaped to receive said plastic chucks to secure said male and female clamping members in a fixed relative orientation in which said first and second recessed curved portions are in facing relation spaced from said extending portion of said hose end member and in which said first and second upraised curved portions are in facing relation adjacent said extending portion of said hose end member, said depression areas having orifices axially aligned with said elongated bores of said plastic chucks when said plastic chucks are received into said depression areas; and

means for fastening said plastic male clamping member to said plastic female clamping member, said fastening means comprising metal self-tapping screw means insertable through said orifices of said plastic female clamping member and self-tappingly engageable into said elongated bores of said plastic chucks, to retain said male and female clamping members together in a fixed clamping position such that said hose end portion adjacent said extending portion of said hose end member is pinched between said sleeve portion and said first and second relatively upraised portions to deform the outer surface thereof to a first degree, and such that said hose end portion in which said at least one upraised ridge is contained is pinched between said sleeve portion and said first and second recessed curved portions to deform the outer surface thereof to a second and lesser degree.

4,411,461

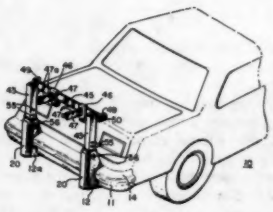
BUMPER GUARDS

Harry Rosenberg, H. R. Packing Equipment and Supplies, 8941 Roosevelt Blvd., Philadelphia, Pa. 19152

Filed Jul. 19, 1982, Ser. No. 399,491

Int. Cl.³ B60R *9/10*

U.S. Cl. 293—108 **7 Claims**



1. Bumper guards for mounting to the bumper of a vehicle, said bumper guards each having opposite side walls and front and rear walls forming an integral socket therebetween,

vertically slidable members engaged in said sockets,

said side walls each having at least one horizontally extending opening,

a horizontal bar connecting said vertically slidable members,

said members having a plurality of vertically spaced, horizontally aligned openings,

members for horizontal insertion through said opening in said side walls of said bumper guards, and said openings in said members for adjusting the heights of said vertically slidable members,

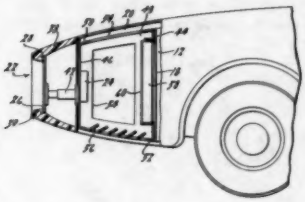
said bumper guards each having a lower connecting plate for restricting rotational movement of said guards and said bumper, and

means for securing said connecting plate to said vehicle.

4,411,462
AUTOMOBILE FRONT END CONSTRUCTION INCORPORATING AN AIR-BAG

Gordon M. Buehrig, and Kathryn L. Buehrig, both of Grosse Pointe Woods, Mich., assignors to Richard P. Kughn, Detroit, Mich.

Filed Feb. 1, 1982, Ser. No. 344,738
Int. Cl.³ B60R 19/10
U.S. Cl. 293—132 20 Claims

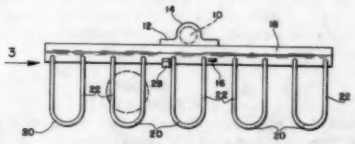


1. In an automotive vehicle,
a front bumper;
yieldable means associated with said bumper for resisting rearward movement thereof;
a normally folded, explodable air-bag behind said bumper; and
supporting frame means carrying said air-bag and adapted to confine the same in the exploded condition,
said yieldable means adapted to permit but actively resist rearward movement of said bumper under a relatively light, rearwardly directed impact force, said supporting frame means adapted to collapse under a relatively heavy, rearwardly directed impact force which is less than an impact force capable of significantly damaging or destructing other major parts of the vehicle, and said air-bag adapted to explode under an impact force greater than said relatively light impact force and adapted further in the exploded condition to resist collapse of said supporting frame means.

4,411,463
GOLF BALL RETRIEVING RAKE

Paul Alderman, 381 Shrewsbury St., Holden, Mass. 01520

Filed Jan. 25, 1982, Ser. No. 342,137
Int. Cl.³ A01D 7/06
U.S. Cl. 294—19 A 4 Claims

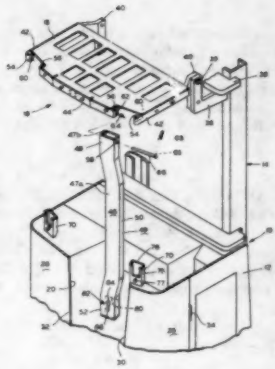


1. A golf ball retriever comprising an elongated head and a series of spaced wire fingers extending from said head in a row,
wherein the fingers are of general U-shape and are spaced apart in a line, the U-shaped fingers having rounded closed ends spaced from the head, said fingers being curved and having their convex aspects facing away from the head to engage the ground, all the fingers facing in the same direction forming a series of open spaced scoops extending from the head,
there being legs forming parts of the U-shaped fingers, said legs being free ended, the free ends being embedded in the head, all legs being spaced apart a distance slightly less than the diameter of a golf ball and the legs of the next adjacent fingers being also spaced apart less than the diameter of a golf ball; the rounded closed ends of the U-shaped fingers being all that engages the ground,
a handle for said head, a generally flat plate on the handle at one end thereof, a pivot offset from the axis of the handle on the plate, said rake head being pivoted with relation to said flat plate whereby the head may be moved into a parallel relationship with respect to the handle or into a transverse relationship with respect thereto.

4,411,464
OPERATOR PROTECTIVE POSTS

James J. Bauer, Richland, Mich., assignor to Clark Equipment Company, Buchanan, Mich.

Filed Aug. 3, 1981, Ser. No. 289,627
Int. Cl.³ B62D 25/06
U.S. Cl. 296—102 6 Claims



1. An industrial vehicle having an upright structure adjacent its front end, a body portion to the rear of the upright structure, an operator's compartment on the body portion, and a protective canopy rigidly mounted cantilever fashion on the upright structure and extending rearwardly over the operator's compartment, comprising
a first elongated post pivotally mounted on said canopy adjacent the distal end thereof and depending therefrom,
a second elongated post pivotally mounted on said canopy adjacent the distal end thereof and depending therefrom,
said second post being spaced laterally from said first post,
each of said posts having an upper end, a middle section and a lower end,
said middle section of each post having a lateral offset relative to said upper and lower ends thereof,
the said two posts selectively mountable on said canopy so that the distance between their respective middle sections is less than the distance between their respective upper ends, and
means associated with said lower ends of said posts respectively for selectively securing the posts to said body portion.

4,411,465
DOOR ACTUATING MECHANISM

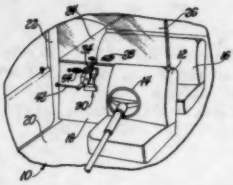
Guy E. Stuart, Jr., 518 Adams St., Owosso, Mich. 48867

Filed Oct. 19, 1981, Ser. No. 313,336
Int. Cl.³ B60J 5/04
U.S. Cl. 296—146 5 Claims

1. An operating mechanism for selectively closing and opening a vehicle door, and comprising;
a support structure and means for mounting said support structure in a fixed location within a vehicle,
an operative link and means for connecting one end of said

link to a rearwardly opening vehicle door forwardly of the door's hinge axis,

and operative means provided on said support structure, readily accessible from the driver's seat in said vehicle, and operatively connected to said operating link for allowing the driver of the vehicle to selectively pull-closed and push-open said vehicle door,



said support structure being provided between the front and back seats of a passenger car vehicle,

a bracket provided on said door and formed to provide a structural extension forwardly of its hinge axis,

and means connecting said operative link to said bracket for transmitting a door actuating force therethrough.

4,411,466

AUTOMOBILE DOOR STRUCTURE

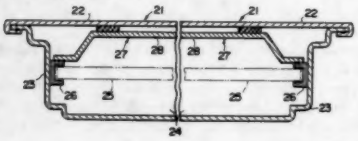
Shoichi Koike, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

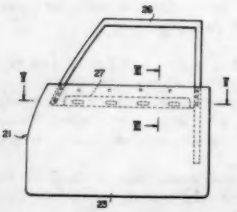
Continuation of Ser. No. 208,387, Nov. 19, 1980, abandoned. This application Jun. 8, 1982, Ser. No. 386,271

Claims priority, application Japan, Dec. 10, 1979, 54-171368[U]

Int. Cl.³ B60J *1/00*

U.S. Cl. 296—188 **2 Claims**





1. An automobile door structure comprising:

a door body including an outer panel and an inner panel forming in combination a door cavity to receive a windowpane therein;

a window sash formed in a generally inverted U-shape to guide and retain said windowpane and having longitudinal front and rear ends respectively secured to the front and rear inner surfaces of said inner panel of the door body;

a reinforcing member housed in said door cavity to extend in a fore-and aft direction of said door body and having front and rear ends respectively secured to the longitudinal front and rear ends of said window sash, said reinforcing member having portions secured to said outer panel of the door body.

4,411,467

FOIL COVERING LAYER FOR SUN VISOR

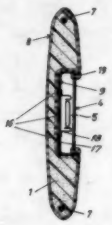
Kurt Cziptschirsch, Wuppertal; Klaus-Peter Kaiser, Wermelskirchen, and Gerhard Zwirner, Haan, all of Fed. Rep. of Germany, assignors to Gebr. Happich GmbH, Fed. Rep. of Germany

Filed Feb. 4, 1981, Ser. No. 231,034

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011158

Int. Cl.³ B60J *3/00*

U.S. Cl. 296—97 H **12 Claims**



1. A sun visor, including a sun visor body having sides, a recess defined in a side of the sun visor body and the recess having side walls of a substantial depth in the visor body for defining the recess;

a covering layer of flexible generally less expansible material surrounding the visor body, the material layer including a section thereof which overlaps the recess, which extends into the recess and which is installed in the recess and contacts the walls thereof and means for making the said covering layer more stretchable than the remainder of the covering layer; the overlapping section of the covering layer being therefore more readily expansible than the remainder of the covering layer, for easing the bringing of the layer into contact with the walls of the recess; said layer of material, at least as it extends over the side of the body and including the section extending into the recess in the body, being an integral piece of the material; said visor further comprising means supporting a mirror, the mirror supporting means being shaped with a profile generally corresponding to the profile defined by the recess, and the layer of the material in the recess being between the walls of the recess and the supporting means.

4,411,468

ROCKING CHAIR

Arthur A. Apissomian, Wadena, Minn., assignor to Homecrest Industries Incorporated, Wadena, Minn.

Filed Mar. 5, 1981, Ser. No. 240,772

Int. Cl.³ A47C *3/02*

U.S. Cl. 297—264 **10 Claims**

1. A rocking chair comprising:

a chair base;

a chair;

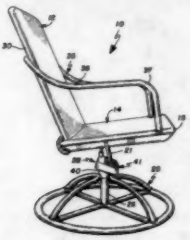
flexible plastic sheet means connected between the chair base and the chair for supporting the chair and its occupant and permitting rocking of the chair with respect to the base in a plane essentially normal to a major surface of the flexible sheet means by flexing of the flexible plastic sheet means;

first mounting means for connecting one end of the flexible sheet means to the chair,

second mounting means for connecting an opposite end of

the flexible sheet means to the chair base, the flexible sheet means extending generally upwardly from the second mounting means to the first mounting means at a slight inclination rearwardly from a vertical position when the chair is unoccupied so that the chair and its occupant initially apply a primarily compressive load to the flexible plastic sheet means,

said second mounting means comprising a support member secured to and above the chair base and having a lower generally flat upwardly extending surface and an aperture extending through said support member above said flat surface, said aperture being of a width at least



equal to that of the flexible sheet means and with the opposed walls of said aperture diverging from the bottom to the top of the aperture, the rear wall of the aperture being curved to provide a controlled decrease in the free length of the sheet means as the chair is rocked rearwardly, and means for fastening the lower end of the sheet means to said flat surface at the slight inclination to the vertical with the sheet means extending upwardly through said aperture towards the first mounting means, and

stop means for stopping the rearward movement of the chair before the sheet means engages the upper end of said curved wall.

4,411,469

CHAIR, PARTICULARLY A DATA DISPLAY CHAIR

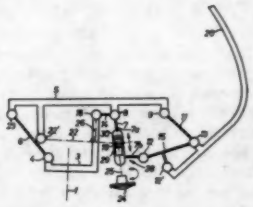
Fritz Drabert, Minden, Fed. Rep. of Germany; Oskar Posch, Biberist, Switzerland; Hans-Joachim Edel, Minden, and Bernhard Schroeder, Porta Westfalica, both of Fed. Rep. of Germany, assignors to Drabert Söhne, Minden, Fed. Rep. of Germany

Filed Jul. 17, 1980, Ser. No. 169,615

Claims priority, application Switzerland, Jul. 23, 1979, 6826/79; Jan. 31, 1980, 787/80; Mar. 31, 1980, 2503/80; May 19, 1980, 3892/80

Int. Cl.³ A47C *3/00*

U.S. Cl. 297—300 **3 Claims**



1. A chair comprising: base means, seat means pivotally supported at said base means; back rest means pivotable with respect to said seat means about a substantially horizontal axis, spring means kinematically coupling said seat means and said back rest means, a first pair of links having first ends pivotally connected to said seat means and second ends pivotally connected to said back rest means, a second pair of links having first ends pivotally connected to said seat means and second ends pivotally connected to said base means, one of said pairs of links forming an angle lever pivotally connected at said seat means, said angle lever provided with means for adjustably supporting one end of said spring means, said means for adjustably supporting said spring means comprises a nut journaled on a threaded spindle, said nut supporting a pivot supporting one end of said spring means, and a bar having one end pivotally supported at said pivot and the other end pivotally supported as said angle lever.

4,411,470

SUPPORTING DEVICE OF A HEAD REST FOR A VEHICLE SEAT

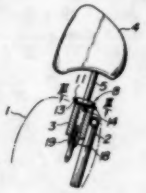
Shinichi Nishimura, Zama; Yoshinori Akiyama, and Yoshiaki Hoshika, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 19, 1980, Ser. No. 208,381

Claims priority, application Japan, Nov. 21, 1979, 54-150940

Int. Cl.³ A47C *1/02*

U.S. Cl. 297—410 **2 Claims**



2. A head rest supporting device of a vehicle seat, in which the head rest is provided with a supporting rod which is in turn supported by a frame forming a seat back such that the height of the supporting rod can be adjusted, comprising in combination:

a guide member secured to the frame of the seat back and having a longitudinally extending bore which guides the vertical adjustable movement of the supporting rod;

a retainer supported by the frame of the seat back and including a friction member which is resiliently urged against the outer surface of the supporting rod so as to vertically retain the head rest at a desired adjusted height; and

releasing means to disengage the friction member from the supporting rod thereby permitting adjustable movement of the supporting rod, said friction member comprising a spring which surrounds the supporting rod in frictional engagement therewith and is expandable radially outwardly to be disengaged from the supporting rod by pushing inwardly the releasing means.

4,411,471

ARM SUPPORT MEMBER FOR SEATS OR CHAIRS, HAVING A VERTICALLY LIFTABLE ARM REST

Giulio Ponzellini, Bologna, Italy, assignor to Castelli S.p.A., Bologna, Italy

Filed Feb. 12, 1981, Ser. No. 233,886

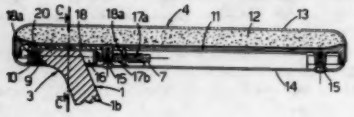
Claims priority, application Italy, Feb. 15, 1980, 35569/80[U]

Int. Cl.³ A47C *7/54*; B60N *1/06*

U.S. Cl. 297—417 **8 Claims**

1. A stack chair comprising a main chair structure and at least one arm assembly, said arm assembly comprising a supporting bracket secured to said main chair structure and having a free end, a generally rectangular arm rest frame and a hinge mechanism for pivotably securing said arm rest frame to the free end of said bracket, said hinge mechanism having a hinge axis parallel to and offset from the vertical center plane of said

arm rest member to allow said frame to be moved from a substantially horizontal use position to a vertical stack position, said hinge mechanism having locking means provided to lock said bracket and frame in both the aforementioned use and



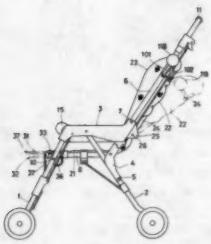
stack positions, first spring means provided to urge said locking means in its engagement position, and second spring for causing the frame to be automatically swung to its vertical position, on moving said arm rest against the bias of said first spring means.

4,411,472

HAMMOCK FOR BABY CARRIAGES

Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushikikaisha, Osaka, Japan

Filed Mar. 27, 1981, Ser. No. 248,426
Claims priority, application Japan, Apr. 11, 1980, 55-48200
Int. Cl.³ A47C *7/50*
U.S. Cl. 297—430 **5 Claims**



1. A hammock for baby carriages which is provided with a substantially horizontally extending seat and a back rest upwardly extending from the rear end of said seat, said hammock comprising: a pair of tubular slide guide rods longitudinally extending under the lower surface of said seat, a pair of sliders each inserted into the associated slide guide rod from the front so as to be slidably guided by said slide guide rod, and a first reinforcing member connected between the front ends of said pair of sliders, said seat including a flexible seat extension hanging down in a loop (36) from a front end of the seat when said pair of sliders are recessed in said guide rods, said flexible seat extension being operatively connected to said first reinforcing member (33) for extending said seat extension loop by forwardly pulling out said sliders, whereby said seat extension is brought into a substantially horizontally extending position by straightening the loop.

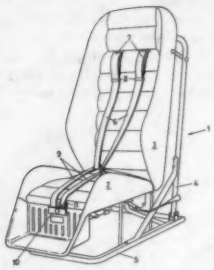
4,411,473

WEBBING HARNESS RESTRAINTS

John P. Ettridge, 235 Diagonal Rd., Warradale, Australia (5046)

PCT No. PCT/AU80/00005, § 371 Date Dec. 26, 1980, § 102(e) Date Dec. 17, 1980, PCT Pub. No. WO80/02379, PCT Pub. Date Nov. 13, 1980
PCT Filed Apr. 24, 1980, Ser. No. 227,084
Claims priority, application Australia, Apr. 9, 1979, PD8329
Int. Cl.³ B60R *21/10*; A47D *13/08*
U.S. Cl. 297—484 **5 Claims**

1. A harness restraint for a person in a seat having a seat portion and a back rest portion, said restraint comprising a pair of shoulder straps, each strap being anchored at its respective upper end above and behind the lower end to enter at the junction of the seat portion and back rest portion generally in parallel relationship in the relaxed state, and a crotch strap anchored at both ends at the front of the seat adapted to pass up



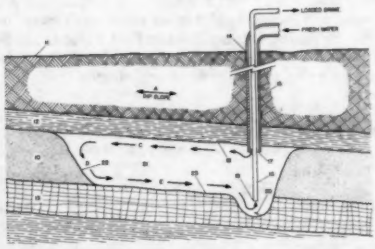
between the legs of the person, around both shoulder straps to draw these together in the area of the crotch, and a single releasable catch on the crotch strap positioned between the legs of the person whereby this single catch controls the release and attachment of the harness.

4,411,474

SOLUTION MINING OF AN INCLINED STRUCTURE

Rudolph S. Higgins, Moab, Utah, assignor to Texasgulf Inc., Stamford, Conn.

Filed May 20, 1981, Ser. No. 265,665
Int. Cl.³ E21B *42/28*
U.S. Cl. 299—4 **6 Claims**

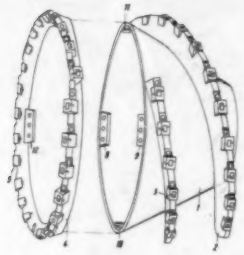


1. A method of solution mining an extractable ore disposed in a sloping subterranean stratum disposed beneath an insoluble stratum comprising the steps of establishing a bore hole communicating with said stratum at a downdip location therein, injecting solvent into said bore hole in such a manner that the solvent will be directed in an updip direction along the upper portion of said stratum to develop a cavity with an expanding mining face remote from said bore hole, and withdrawing solvent with dissolved ore through said bore hole at an exit point disposed vertically from the entrance point at which the incoming water is discharged into the cavity from the bore hole, adjusting such withdrawal to provide for downflow of the water across said mining face and downwardly in a downdip direction along the floor of said cavity to said exit point at a rate sufficient to extract said ore stratum without appreciable mining of vertically adjacent strata.

4,411,475
CUTTING DRUM

Gerd Best, Sprockhoevel, and Norbert B. Weikert, Dortmund, both of Fed. Rep. of Germany, assignors to Krampe & Co. Fertifung in Bergbaubedarf GmbH, Hamm, Fed. Rep. of Germany

Filed Oct. 2, 1980, Ser. No. 193,165
Int. Cl.³ E21C *25/10*
U.S. Cl. 299—81 5 Claims

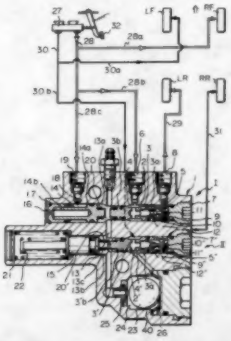


1. A cutting drum for an extracting machine as used in mining, comprising a base body having a conical or frustoconical jacket and a major annular face, at least one spiral member wound about the jacket and projecting away therefrom, a first set of cutting tools secured to said spiral member, an end ring having a frustoconical jacket, a major annular face and a minor annular face, the circumference of said minor annular face corresponding to the circumference of the major annular face of said base body and the slope of the jacket of said end ring corresponding to the slope of the jacket of said base body, a second set of cutting tools secured to said end ring, and means for detachably connecting the minor annular face of said end ring to the major annular face of said base body.

4,411,476
HYDRAULIC PRESSURE CONTROL VALVE

Naganori Koshimizu, Yokohama, Japan, assignor to Tokico Ltd., Kanagawa, Japan

Filed Jun. 11, 1982, Ser. No. 387,683
Claims priority, application Japan, Jun. 15, 1981, 56-87651[U]
Int. Cl.³ B60T *8/18, 8/26*
U.S. Cl. 303—6 C 3 Claims

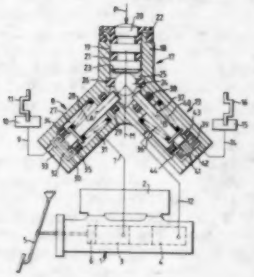


1. A hydraulic pressure control valve comprising a housing, first and second pressure control mechanisms each including a stepped piston slidably disposed in a stepped bore in the housing and defining an inlet liquid chamber and an outlet liquid chamber in the stepped bore, each said piston having therethrough a connecting passage for connecting said two liquid chambers, each of said mechanism having a valve mechanism for closing said connecting passage in response to the displacement of the stepped piston, said pressure control valve further having a control chamber therein to which one ends of said stepped pistons being exposed with the hydraulic pressure in the control chamber biasing the stepped pistons in the direction opening the valve mechanisms, a plunger slidably fitted in the housing with one end thereof being exposed to the control chamber, a pressure control spring acting on the other end of the plunger, a stepped emergency piston with one end having a large pressure area being exposed to said control chamber and being adapted to abut with or separate from said one end of the first stepped piston, an emergency chamber connected to the inlet liquid chamber of the first pressure control mechanism and being exposed to the other end of the emergency piston having a small pressure receiving area, and an inertia valve provided in a passage connecting the control chamber with the inlet liquid chamber of the second pressure control mechanism.

4,411,477
TWO-CIRCUIT PRESSURE CONTROL UNIT FOR HYDRAULIC BRAKE SYSTEMS

Jochen Burgdorf, Offenbach, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Continuation of Ser. No. 174,769, Aug. 1, 1980, abandoned. This application Nov. 19, 1982, Ser. No. 443,082
Claims priority, application Fed. Rep. of Germany, Sep. 10, 1979, 2936502
Int. Cl.³ B60T *8/00, 8/18*
U.S. Cl. 303—22 R 42 Claims



1. A two-circuit pressure control unit for a dual-circuit hydraulic brake system comprising:

two control pistons each disposed in a different one of said dual-circuits and operating to close an associated control valve against an associated spring force upon an increase of inlet pressure;

a rigid supporting member having a supporting surface; and

a compensation member disposed to abut said supporting surface and to abut each of said control pistons, said control pistons being disposed symmetrically with respect to a central plane of said compensation member with each of said control pistons being inclined with respect to said plane in opposite directions and at the same angle and said compensation member is a whole rigid solid of revolution selected from one of a whole cylinder and a whole ball, said selected one of said cylinder and said ball having a single continuous curved surface in operative relationship with said supporting surface and each of said control pistons.

4,411,478

ROLLING BEARING FOR LENGTHWISE GUIDING OF A SHAFT OR THE LIKE

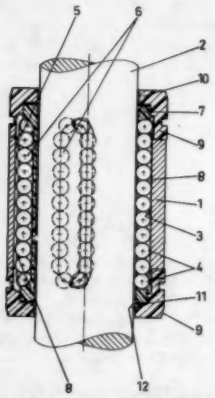
Armin Olschewski, Schweinfurt; Manfred Brandenstein, Eussenheim; Lothar Walter, Schweinfurt, and Horst M. Ernst, Eltingshausen, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 2, 1981, Ser. No. 317,504

Claims priority, application Fed. Rep. of Germany, Nov. 6, 1980, 3041804

Int. Cl.³ F16C *29/06*; F16J *15/32*

U.S. Cl. 308—6 C 8 Claims



1. In a rolling bearing for lengthwise movement along a shaft, comprised of an outer sleeve, axially extending races in the bore of the outer sleeve for loaded rolling bodies and return races for unloaded rolling bodies, with at least one endless row of rolling bodies positioned in said races, and a sealing ring mounted on each end of said outer sleeve, the bore surface of the outer sleeve adapted to slide on said shaft; the improvement wherein each said sealing ring has a thin elastically bendable radially inwardly directed sealing lip, the inner diameter of the bore of said sealing lips, when the shaft is not assembled in said rolling bearing, being less than the diameter of said shaft, said bearing having limiting walls defining free spaces on both the axially opposite sides of each sealing lip for limiting the movement, of said lips whereby said sealing lips may be selectively bulged in opposite axial directions into said spaces upon lengthwise movement of the shaft in opposite directions, when the shaft is assembled in the bore of said rolling bearing.

4,411,479

DOUBLE ROW ANGULAR CONTACT BALL BEARING WITH ONE-PIECE OUTER RING AND ONE-PIECE INNER RING

Minoru Hirata, Kosugi, and Tsutae Takeda, Toyama, both of Japan, assignors to Kabushiki Kaisha Fujikoshi, Toyama, Japan

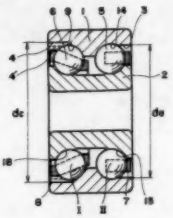
Filed Oct. 7, 1981, Ser. No. 309,456

Claims priority, application Japan, Oct. 17, 1980, 55-144399

Int. Cl.³ F16C *19/08*

U.S. Cl. 308—195 6 Claims

1. In a double row angular contact ball bearing comprising a one-piece inner ring, a one-piece outer ring disposed concentric with the inner ring, first and second rows of balls disposed between said inner and outer rings with a predetermined angle of contact, and first and second cages for respectively holding said first and second rows of balls, the number of balls comprising said first row, inserted between a first raceway track of said inner ring and a first raceway track of said outer ring adapted to be subject to a higher load, being greater than the number of balls of said second row, inserted between a second raceway track of said inner ring and a second raceway track of said outer ring, said balls of said first row being inserted in a maximum-type manner, wherein said second raceway track of said outer ring is an angular contact raceway laterally open at one side throughout the circumferential extent of said outer ring, and said first raceway track of said outer ring is cut out from the bottom thereof in a substantially radially outward direction and then laterally toward an end face of said outer ring to form an inner cylinder bore surface, and said bore surface has a



diameter greater than the diameter of the bottom of said first raceway track of said outer ring at least by an amount corresponding to more than 5% of the diameter of said balls, such that during assembly of said bearing, said first row of balls and said inner ring in contact therewith are able to be displaced tiltingly and then radially outwardly with respect to said outer ring to provide a greater space for inserting the balls of said second row without causing excessive axial misalignment between said second raceway track of said inner ring and said second raceway track of said outer ring, thereby enabling a greater number of balls to be included in said second row.

4,411,480

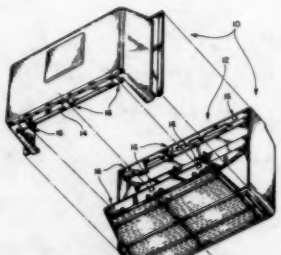
MEANS FOR ATTACHING TELEVISION RECEIVER CABINET BACK PANELS

Kenneth L. Gibson, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Apr. 26, 1982, Ser. No. 371,701

Int. Cl.³ A47B *81/06*; H01R *13/44*

U.S. Cl. 312—7.2 1 Claim



1. For use in a television receiver having a molded plastic cabinet with an access opening in the back and having a removable back panel for covering said opening, at least one quick-release means for attaching said panel to said cabinet comprising flexible molded extensions of said cabinet, said quick-release means including:

a pair of face-to-face catch means having a projecting flange on each face tapered for sliding and flexing into mutual engagement, said catch means including a first member extending from a flexible edge of said cabinet, and a sec-

ond member extending from said panel for joining in snap engagement with said first member;

a pair of guide means extending from said panel and spaced on either side of said second member, said guide means having a taper for guiding said panel and said catch means into sliding engagement, and for exerting pressure on said flexible edge for inhibiting disengagement of said catch means;

spring means extending from said cabinet adjacent to the first member for exerting disengaging pressure on said catch means and said panel;

pocket means in said panel leading to said catch means for receiving a parting tool for flexing said first member out of engagement with said second member;

whereby said spring means urges said catch means and said back panel into disengagement from said cabinet when said parting tool is inserted into said pocket means, and said panel can be re-engaged by exerting pressure on said panel against said spring means for snap engagement of said catch means.

4,411,481

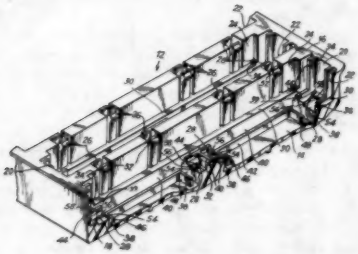
HOLDER FOR AUDIO/VIDEO CASSETTES, GAMES CARTRIDGES AND STORAGE CASES

Joseph L. Berkman, 48 Country Rd., Mamaroneck, N.Y. 10543

Filed Dec. 21, 1981, Ser. No. 332,974

Int. Cl.³ A47B *81/06*

U.S. Cl. 312—8 **21 Claims**



1. A storage unit or holder having at least one bin for video cassettes and video game cartridges, wherein the bin is capable of interchangeably receiving and storing differently sized video cassettes and differently sized video game cartridges; each bin comprising a generally rectangular configuration and is generally bounded by a bottom wall, side walls, and end walls; at least one of the side walls having a plurality of resilient fingers for holding said video cassettes; another bottom wall above said bottom wall and on both sides of each bin transversely extending substantially for the width of said bin, and terminates generally at second end walls extending upwardly from said another bottom wall; additional side walls extending from said bottom wall to said another bottom wall; additional end walls extending from said bottom wall to further bottom walls and being disposed between said bottom wall and said another bottom wall; and at least one channel shaped guide extending upwardly from said bottom wall between said additional end walls; additional bottom walls between said bottom wall and said further bottom walls; secondary side walls and at least two fourth end walls extending between said additional botton walls and said further bottom walls; wherein each bin can hold on said another bottom wall one video cassette of either Beta or VHS configuration, or two video game cartridges on said bottom wall of either the same or different configuration.

4,411,482

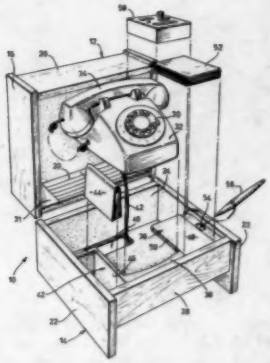
TELEPHONE ORGANIZER

Nikolaus Hoff, 31 Howbert Dr., Weston, Ontario, Canada

Filed Mar. 20, 1981, Ser. No. 245,657

Int. Cl.³ H04M *1/02*; A47B *63/00*

U.S. Cl. 312—233 **4 Claims**



1. A telephone organizer, comprising:

a box-like enclosure having a lower tray-like portion receiving a telephone therein and an upper lid-like portion hingedly mounted to said lower portion for opening said enclosure through hinge means which permits said upper portion to be hingedly moved between a first position wherein said upper and lower portions define said enclosure and a second position wherein said upper portion is perpendicular to said lower portion;

said lower portion having a bottom wall on which said telephone rests and which slopes upwardly from the rear wall to the front wall thereof, said bottom wall having an opening therethrough located adjacent the rear wall of the lower portion and coinciding with the telephone to permit a telephone connecting cable to extend into the enclosure and hook up with the telephone, the front wall of said lower portion extending downwardly a distance less than the vertical height of the side walls and terminating below the vertical position of the adjacent end of the rear wall;

means within said lower portion holding said telephone in a substantially fixed position therein, and

means within said lower portion for locating at least one telephone ancillary item in said enclosure comprising means defining a recess for receiving a personal telephone directory, means defining a plate for receiving a note-pad thereon, and means defining a writing implement holder, said recess-defining means, said plate-defining means and said holder-defining means comprising a one-piece molded insert positioned in said lower portion.

4,411,483

FRAME FOR PC-BOARDS

Rudolf Hübner, and Rolf Grabenhorst, both of Bremen, Fed. Rep. of Germany, assignors to Vereinigte Flugtechnische Werke GmbH, Bremen, Fed. Rep. of Germany

Filed Apr. 13, 1981, Ser. No. 253,873

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1980, 8010147[U]

Int. Cl.³ H05K *5/00*

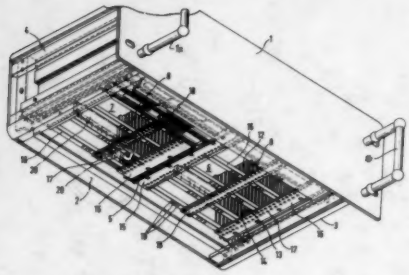
U.S. Cl. 339—17 M **5 Claims**

1. A drawer-like frame for mounting printed circuit boards and terminal elements for such boards and having at least two walls facing each other across a mounting space and additional joining walls completing the frame having an open bottom, a mounting structure, comprising:

mounting bars disposed on the walls and near the open bottom of the frame;

a plurality of transverse bars fastened to the mounting bars, extending across said bottom laterally spaced from the joining walls and having a plurality of bores extending transversely to the bottom of the frame; and

at least one longitudinal mounting plate having bores likewise



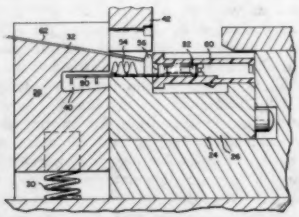
extending transversely to the bottom of the frame, said plate having been mounted on said transverse bars while extending parallel to said mounting bars on the walls, said mounting plate being provided for mounting terminal elements in that such a terminal element extends parallel to the transverse bars but is fastened with one end to said mounting plate, and with its other end to one of said mounting bars on one of the walls.

4,411,484

TERMINATIONS FOR FLAT CABLE

Daniel T. Casey, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 122,539, Feb. 19, 1980, Pat. No. 4,335,497.
This application Mar. 18, 1981, Ser. No. 244,987
Int. Cl.³ H01R *9/07, 4/24*
U.S. Cl. 339—97 C **2 Claims**



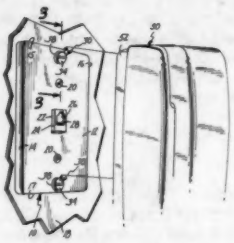
1. In combination with an electrical connector and a flat multi-conductor cable, said connector having an insulating housing with at least one terminal receiving passageway therein, a like number of electrical terminals each having a crimp portion adapted to be crimped to a flat electrical conductor of said cable, a mating portion connected to the crimp portion, and a tine provided on the terminal, said tine forming means for limiting the insertion of the terminal into a respective passageway when the terminal is initially inserted therein with its mating portion leading, so that the crimp portion remains wholly outside the passageway, the tine being subsequently deformable to allow the crimp portion of the terminal to be inserted into the passageway; characterized in that the tine is upstanding from the terminal between the mating portion and the crimp portion thereof so as to engage an external wall of the housing defining an end of the passageway, when the mating portion has been inserted into the passageway through such end, and in that the tine is plastically deformable so as to lie within the cross-section of the passageway, said tine forming means for abutting an edge of said flat cable to limit edgewise advancement of said cable and to correctly position said cable edge with respect to the terminal crimp portion.

4,411,485

WALL PLATE KIT FOR TELEPHONES

Ronald W. Wiseheart, Hector, and Daniel Meyer, Rochester, both of Minn., assignors to Communications Systems, Inc., Hector, Minn.

Filed Jul. 24, 1981, Ser. No. 286,524
Int. Cl.³ H02B *1/02*
U.S. Cl. 339—125 R **7 Claims**



1. A wall plate for use with a communciation receptacle and a telephone, the wall plate comprising:

a front wall having an aperture for positioning and presenting a communication jack for conductive connection with the telephone;

post means for hanging the telephone proximate the front wall, said post means including shoulder posts, each post having a shoulder which engages a front surface of the plate, said plate having a sleeve through which the posts pass to permit the posts to be tightened as the sleeve is forced against a mounting frame;

means for detachably receiving and retaining the post means for hanging the telephone, said front wall having apertures through which the post means pass, and said means for detachably receiving and retaining the post means comprising said mounting frame having a threaded opening aligned with each aperture for threadably receiving the post means; and

cover plug means for selectively inserting into and covering from view the apertures when the post means are removed from the apertures, said plug means including a pair of plugs, each plug having a top with a coaxial shaft extending therefrom having radially extending resilient vanes for frictional engagement with an interior of the sleeve, the plate having a depression around the apertures so the tops of the plugs are substantially flush with the top surface of the wall plate when inserted into the aperture.

4,411,486

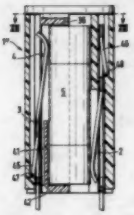
FUSE HOLDER FOR A CARTRIDGE FUSE

Martin Behrendt, Hagen, Fed. Rep. of Germany, assignor to Wickmann-Werke AG, Witten-Annen, Fed. Rep. of Germany

Filed Feb. 19, 1981, Ser. No. 236,117
Claims priority, application Austria, Feb. 25, 1980, 1026/80
Int. Cl.³ H01R *19/12*
U.S. Cl. 339—147 R **20 Claims**

1. A fuse holder for removably holding an elongate electrical cartridge fuse having a longitudinal axis and an end cap at each end of the longitudinal axis, said holder comprising: an insulating housing having an elongate mounting recess dimensioned to receive therein said fuse, said mounting recess having a longitudinal axis extending parallel to the longitudinal axis of the fuse when the fuse is disposed in the mounting recess, and

a pair of contacts in said housing for engaging respective ones of said end caps, wherein said housing has means therein defining a pair of slots, said slots being positioned diametrically opposite one another in said housing and extending substantially parallel with said longitudinal axis of said mounting recess, and said contacts being arranged one in each of said



slots, each of said contacts having an elongate spring contact tongue extending lengthwise of and projecting inwardly out of a respective slot for directly engaging a respective end cap on said fuse and having a contact tab projecting out of an end of the housing for electrical connection to other circuitry during use of the fuse holder.

4,411,487

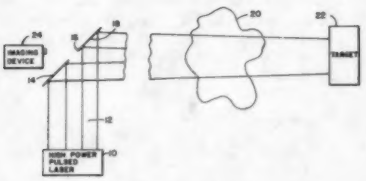
DEVICE FOR SEEING THROUGH BATTLEFIELD SMOKES AND AEROSOLS

Thomas G. Miller, Madison, and Robert G. Polk, Toney, both of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 2, 1981, Ser. No. 279,647

Int. Cl.³ G02B *17/00, 27/02*

U.S. Cl. 350—1.1 **4 Claims**



1. A device for seeing through an aerosol cloud cover comprising a high power laser source which produces a laser output that is directed to a mirror and reflected off the surface of said mirror and through said aerosol cloud cover to produce a hole therein, and viewing means aligned with a hole in said mirror and viewing through said hole in said mirror and the hole produced in said cloud cover for viewing objects camouflaged by said cloud cover.

4,411,488

AFOCAL ZOOM REFRACTOR TELESCOPES

Iain A. Neil, Bearsden, Scotland, assignor to Barr & Stroud Limited, Glasgow, Scotland

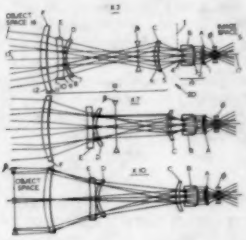
Filed May 7, 1981, Ser. No. 261,689

Claims priority, application United Kingdom, May 30, 1980, 8017264

Int. Cl.³ G02B *1/02, 15/16, 25/00*

U.S. Cl. 350—1.4 **7 Claims**

1. An afocal zoom refractor telescope formed by a variable magnification achromatic objective system and a fixed focus eyepiece system aligned on a common optical axis and arranged to provide an internal real image, said objective system being formed by a primary lens element and three other lens elements and said eyepiece system being formed by two lens elements, each of the six lens elements being made of a material which has a useful spectral bandpass in the infrared wavelength region and having refractive surfaces intercepting said optical axis which are substantially spherical, that one of the other objective system lens elements which is proximal the primary lens element being colour corrective, with a V-value of not less than 120, negatively powered, having a lower refractive index than the remaining objective system lens elements, meniscus in shape and convex towards the real image and is fixedly coupled to the adjacent other objective system lens element which is meniscus in shape and concave towards



the real image, said coupled lens elements having substantially zero separation between their adjoining refractive surfaces on said common optical axis, said separation increasing as distance off-axis increases and being mounted for movement in a first locus along the optical axis, the objective system lens element which is proximal the eyepiece system is mounted for movement in a second locus along the optical axis, and means are provided for simultaneously moving said lens elements non-linearly through said first and second loci whereby the magnification of said afocal zoom refractor telescope can be varied between minimum and maximum values.

4,411,489

SYSTEM FOR SYNTHESIZING STRIP-MULTIPLEXED HOLOGRAMS

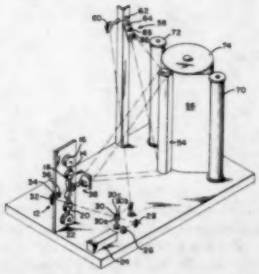
Steve P. McGrew, Postbus 1860, Amsterdam, Netherlands

Continuation of Ser. No. 716,463, Aug. 23, 1976, Pat. No. 4,206,965. This application Mar. 3, 1980, Ser. No. 126,343

The portion of the term of this patent subsequent to Jun. 10, 1997, has been disclaimed.

Int. Cl.³ G03H *1/26*

U.S. Cl. 350—3.76 **60 Claims**



1. A system for synthesizing strip-multiplexed holograms, comprising:

image projection means for sequentially generating a plurality of two-dimensional images in coherent light;

anamorphic projection means for compressing said images in a first direction and expanding said images in a second direction to form an elongated object beam, said second

direction being orthogonal to said first direction, said anamorphic projection means being positioned directly beyond said image projection means before said object beam has significantly diverged;

reference beam generating means for generating an elongated reference beam of coherent light;

holographic recording medium transport means for sequentially advancing a holographic recording medium in a predetermined direction by a predetermined increment for each two-dimensional image generated by said image projection means; and

beam combining means spaced apart from said anamorphic projection means for transforming said image beam into a substantially cylindrical wavefront, superimposing said reference beam onto said cylindrical wavefront, and projecting said cylindrical wavefront and said reference beam together onto said holographic recording medium such that at least one strip hologram is recorded on said recording medium for each of said two-dimensional images to form a strip-multiplexed hologram.

4,411,490

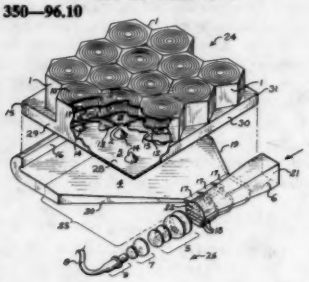
APPARATUS FOR COLLECTING, DISTRIBUTING AND UTILIZING SOLAR RADIATION

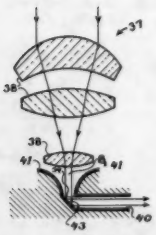
Maurice Daniel, 1733 19th St., N.W., Washington, D.C. 20009

Filed Aug. 18, 1980, Ser. No. 178,784

Int. Cl.³ G02B *5/14*

U.S. Cl. 350—96.10 **20 Claims**





1. A panel structure for collecting and distributing electromagnetic radiation, said panel structure comprising:

(a) a radiation gathering means for gathering electromagnetic radiation incident thereon and for transmitting electromagnetic radiation so gathered;

(b) light collection chamber means positioned to receive the electromagnetic radiation transmitted from said radiation gathering means, said radiation gathering means including a plurality of cell structures each having a focusing means for focusing electromagnetic radiation incident thereon toward said light collection chamber means, the exterior surface of said light collection chamber means including at least one optical window positioned relative to each said cell structure such that the electromagnetic radiation focused by each said focusing means toward said light collection chamber means passes through said optical window to be received by said light collection chamber means;

(c) reflecting means mounted within said light collection chamber means for redirecting the electromagnetic radiation received by said light collecton chamber means; and

(d) light trap means for capturing the electromagnetic radiation redirected by said reflecting means and for conducting the electromagnetic radiation so captured away from said light collection chamber, said light trap means including at least one transparent entrance window means positioned along the interior surface of said light collection chamber means to enable the electromagnetic radiation redirected by said reflecting means to enter said light trap means.

15. A panel structure for collecting and distributing electromagnetic radiation, said panel structure comprising:

(a) a radiation gathering means for gathering electromagnetic radiation incident thereon and for transmitting the electromagnetic energy so gathered; said radiation gathering means including lens means for collecting radiation over a wide angular range and focusing the radiation so collected into a narrow beam and optical window means positioned to receive said narrow beam of radiation, said optical window means including an aperture bounded by curved mirror surfaces diverging outwardly from said aperture toward said lens means;

(b) and light transmitting means positioned to receive said beam of radition from said optical window and operating to transmit said radiation as a single beam.

4,411,491

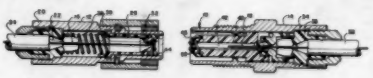
CONNECTOR ASSEMBLY WITH ELASTOMERIC SEALING MEMBRANES HAVING SLITS

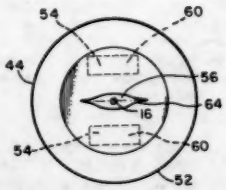
Joseph F. Larkin, Holland, and Malcolm H. Hodge, Wyncote, both of Pa., assignors to TRW Inc., Redondo Beach, Calif.

Filed Sep. 10, 1981, Ser. No. 301,113

Int. Cl.³ G02B *7/26*

U.S. Cl. 350—96.21 **23 Claims**





1. A connector for connecting the ends of two optical fibers comprising:

a plug component for matingly engaging with a receptacle component, the plug component having a first means for receiving and retaining a first optical fiber therein and a first elastomeric sealing membrane covering the mating end thereof for enclosing the interior of the plug component, the first sealing membrane having a slit therein;

a receptacle component having a second means for receiving and retaining a second optical fiber therein and a second elastomeric sealing membrane over the mating end thereof for enclosing the interior thereof, the second sealing mem-

brane having a slit therein, said slits in the first and second sealing membranes positioned to register upon mating engagement of said components; and

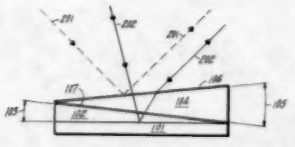
displacement means operable upon the engagement of the plug and receptacle components to stretch the first and second sealing membranes in a direction transverse to said slits to open the slits for the passage of the first fiber therethrough and into engagement with the second fiber and operable upon disengagement of the plug and receptacle components and withdrawal of said first fiber from engagement with the second fiber, to relax the first and second sealing membranes to close the slits.

4,411,492

DISPERSIONLESS REFRACTOR FOR USE WITH HIGH-POWER LASERS

John H. Bluege, Lake Park, Fla., assignor to United Technologies Corporation, Hartford, Conn.

Filed Feb. 11, 1981, Ser. No. 233,417
Int. Cl.³ G02B *27/14*
U.S. Cl. 350—173 **5 Claims**



1. Apparatus for manipulating optical beams comprising:

a reflective substrate;

a dichroic coating optically reflective to a first optical beam and transmissive to a second optical beam;

at least two wedge prisms, formed from at least two materials optically transmissive to said second optical beam, each having an index of refraction, material dispersion, wedge angle and entrance and exit surfaces;

in which one of said at least two prisms is mounted on said reflective substrate, the others of said at least two prisms are mounted adjacent said one of said prisms with the exit surface of one prism adjacent the entrance surface of the next prism and said dichroic coating is mounted adjacent that entrance surface furthest from said substrate, whereby radiation in said second optical beam passes through said dichroic coating and said first and second prisms, is reflected from said substrate back through said prisms and coating in such a manner that the material dispersions of said first and second prisms cancel so that said radiation in said second optical beam exits from said dichroic coating having substantially zero chromatic dispersion.

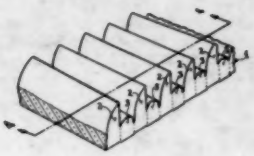
4,411,493

SEASONAL CONTROL SKYLIGHT GLAZING PANEL WITH PASSIVE SOLAR ENERGY SWITCHING

Jack V. Miller, 700 N. Auburn Ave., Sierra Madre, Calif. 91024

Filed Oct. 5, 1981, Ser. No. 308,899
Int. Cl.³ G02B *17/00, 27/00*
U.S. Cl. 350—262 **5 Claims**

1. A substantially transparent one piece glazing panel for generally horizontal mounting in a skylight and comprising a repeated pattern of two alternating and contiguous linear optical elements; a first optical element being an upstanding generally right-triangular linear prism, and a second optical element being an upward-facing plano-cylindrical lens in which the



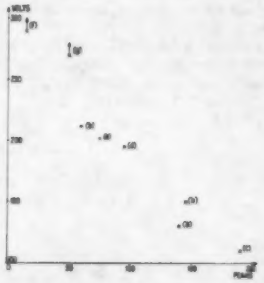
planar surface is reflectively opaque and is generally in the same plane as the base of the right-triangular prism.

4,411,494

ROUGHENING SURFACES FOR HOMEOTROPIC LAYERS OF SMECTIC LCD'S

William A. Crossland, Harlow, and David Coates, Bishop's Stortford, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 965,552, Dec. 1, 1978, abandoned. This application Nov. 21, 1980, Ser. No. 209,235
Claims priority, application United Kingdom, Jan. 18, 1978, 2062/78
Int. Cl.³ G02F *1/137, 1/133*
U.S. Cl. 350—339 R **2 Claims**



2. A method of forming a smectic cell having a low switching voltage threshold comprising the steps of:

providing two spaced, parallel glass plates each having an inwardly facing surface;

disposing a transparent electrode on each of said inwardly facing surfaces;

depositing by a chemical vapor reaction a transparent layer of silica on each of said electrodes;

etching each of said layers for a predetermined period of time to provide a roughened inwardly facing surface of a predetermined roughness for each of said electrodes so that said display has said low switching voltage threshold;

assembling said plates to define a cell; filling said cell with a smectic material;

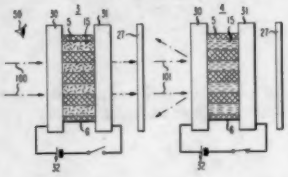
and

sealing said cell.

4,411,495
REFRACTIVE INDEX SWITCHABLE DISPLAY CELL

Gerardo Beni, Old Bridge; Harold G. Craighead, Fair Haven, and Susan Hackwood, Freehold, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 15, 1981, Ser. No. 254,509
Int. Cl.³ G02F 1/133, 1/07, 1/135, 1/137
U.S. Cl. 350—347 V 10 Claims

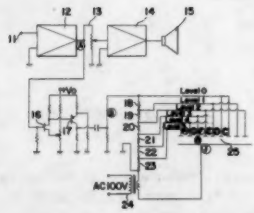


1. A display cell which comprises:
a first optically nonabsorbing material having a first index of refraction;
a second optically nonabsorbing material dispersed within said first material and having a second index of refraction, the difference between said first and said second indices of refraction being variable over a range of values; and
electrode means disposed about a portion of said first optically nonabsorbing material for establishing an electric field in said first and second optically nonabsorbing materials which changes said difference over a portion of said range, so that said display cell has varying degrees of opacity and each degree of opacity is substantially uniform over the visible light spectrum.

4,411,496
DAP, LCD DEVICE WITH A BIAS VOLTAGE

Keisaku Nonomura; Masataka Matsura, both of Tenri, and Tomio Wada, Nara; all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 829,285, Aug. 31, 1977, abandoned.
This application Dec. 12, 1980, Ser. No. 102,931
Claims priority, application Japan, Aug. 31, 1977, 52-105139
Int. Cl.³ G02F 1/133, 1/137
U.S. Cl. 350—347 E 8 Claims

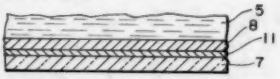


2. A liquid crystal color display cell comprising:
first and second opposed electrode means having liquid crystal material disposed therebetween, said first electrode means comprising a plurality of spaced segment electrodes arranged in a row, said second electrode means being substantially coextensive with said first electrode means along said row;
said liquid crystal material exhibiting a Fredericksz transition effect wherein said material transmits different characteristic colors of light in response to different voltage levels applied across said first and second electrode means in an operating range defined between a minimum threshold voltage and a maximum cut-off voltage, said liquid crystal material blocking the transmission of light therethrough for applied voltages below said minimum threshold voltage and transmitting light with a cloudy appearance for applied voltages above said maximum cut-off voltage;
a signal voltage source means for applying a different voltage level to each of the segment electrodes in stepped incremental levels to exhibit an incremental color change across said cell along said row; and
bias voltage source means for applying a bias voltage substantially corresponding to said minimum threshold voltage level to said second electrode means to thereby assure that at least some color will be visually perceived across the face of said cell in the regions of said segment electrodes regardless of the voltage levels applied thereto by said signal voltage source.

4,411,497
ELECTROCHROMIC DISPLAY ELEMENT

Kazusuke Yamanaka, Shiroyama, and Shouji Mochizuki, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 11, 1981, Ser. No. 233,469
Claims priority, application Japan, Feb. 26, 1980, 55-23077[U]
Int. Cl.³ G02F 1/17
U.S. Cl. 350—357 24 Claims

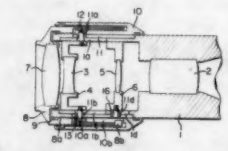


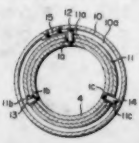
1. An electrochromic display element comprising a display electrode, a counter electrode and a liquid electrolyte disposed intermediately between said display electrode and said counter electrode, wherein the counter electrode is comprised of a sintered material formed by sintering an atomized material comprising a powder of carbon and a powder of one compound selected from the group consisting of $Sn(Fe(CN)_6)$, $MnK(Fe(CN)_6)$, $NiK(Fe(CN)_6)$, amorphous $Fe_2(WO_4)_x$, where $2.5<x\leqq 3.0$, amorphous $FeWO_4$, amorphous $Mn_2(WO)_4)_3$ and amorphous $MnWO_4$.

4,411,498
ZOOM LENS BARREL

Takeshi Muryoi, Chigasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 23, 1981, Ser. No. 246,361
Claims priority, application Japan, Mar. 31, 1980, 55-41475[U]
Int. Cl.³ G02B 7/00, 7/11
U.S. Cl. 350—429 5 Claims





1. In a zoom lens barrel having on the outside of a fixed ring

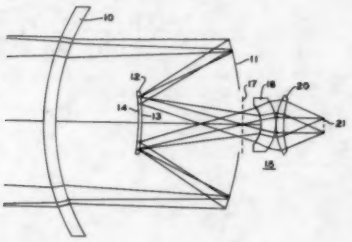
an operating ring rotatable about the optical axis and rectilinearly movable in the direction of the optical axis, and wherein a focusing lens optical system is driven by the rotation of said operating ring for focusing and a zooming lens optical system is driven by the rectilinear movement of the operating ring for zooming, the improvement comprising, said operating ring having in an inner periphery thereof an operating ring groove extending circumferentially of said operating ring, said fixed ring having at least first, second and third fixed ring grooves formed therein substantially equidistantly about the periphery of said fixed ring and extending at a first predetermined angle with respect to the operating ring groove, a cam ring provided inside said operating ring and having at least first, second and third cam ring grooves formed therein substantially equidistantly about the periphery of said cam ring, the first, second and third cam ring grooves each extending at a second predetermined angle with respect to the first, second and third fixed ring grooves, respectively, and at a third predetermined angle with respect to said operating ring groove, and a lens frame member for holding part of said zooming lens optical system provided inside of said fixed ring and having at least first, second and third projecting members thereon formed substantially equidistantly in the circumferential direction of said lens frame member, the first, second and third projecting members respectively extending through the first, second and third fixed ring grooves and through the first, second and third cam ring grooves and being fitted in said operating ring groove.

4,411,499

COMPACT OPTICAL SYSTEM

Irving R. Abel, Lexington, and Marcus R. Hatch, Arlington, both of Mass., assignors to Honeywell Inc., Minneapolis, Minn.

Filed Nov. 7, 1980, Ser. No. 204,968
Int. Cl.³ G02B *17/08*
U.S. Cl. 350—442 **14 Claims**



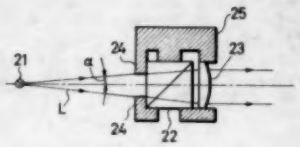
1. An improved, compact optical system comprising:
a concave primary mirror;
a convex secondary mirror;
the primary mirror converging radiation to the secondary mirror;
the secondary mirror comprising a lens having a first and a second surface, the second surface being coated with reflective material, the radiation received from the primary mirror being refracted at the first surface, reflected back from the second surface, and then refracted once again by the first surface, the first and second surfaces having a shape for providing control of field curvature; and
wherein system compactness is measured by the ratio (system physical length)/(system focal length) and wherein the ratio is less than 0.38, the systeem physical length being defined as the distance from the secondary mirror to the focal plane whenever the focal plane is at or behind the primary mirror and as the distance between the primary and secondary mirrors whenever the focal plane is located between the primary and secondary mirrors.

4,411,500

OPTICAL SYSTEM FOR REPRODUCING INFORMATION

Seiji Yonezawa, Hachiouji, and Toshio Sugiyama, Toyokawa, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 6, 1980, Ser. No. 157,254
Claims priority, application Japan, Jun. 25, 1979, 54-85976[U]
Int. Cl.³ G02B *17/00*
U.S. Cl. 350—446 **11 Claims**



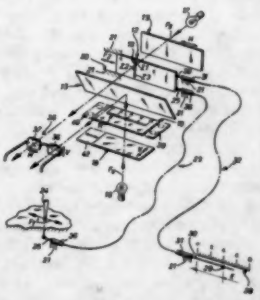
1. An optical system for reproducing information recorded on a disk comprising:
light source means including a semiconductor laser for emitting a laser beam having a substantially-elliptical distribution pattern; and
means for converting the substantially-elliptical distribution pattern of the laser emitted by the light source means into a substantially-circular distribution pattern on said disk, wherein said means for converting comprises:
a plano-convex lens which is disposed along the optical path of said laser beam between said light source means and said disk, the plane part of the plano-convex lens being arranged on the side of said light source means; and
means providing a circular opening which is smaller than the divergence of the laser beam of the light source means and is provided in the optical path between said light source means and said plano-convex lens.

4,411,501

DEVICE FOR CHECKING THE PHORIA OF AN INDIVIDUAL UNDER CONDITIONS OF CLOSE VISION

Luc A. Tagnon, St. Mande, France, assignor to Essilor International, Creteil, France

Filed Aug. 22, 1980, Ser. No. 181,181
Claims priority, application France, Aug. 22, 1979, 79 21133
Int. Cl.³ A61B *3/02*
U.S. Cl. 351—202 **8 Claims**



1. A phoria testing device comprising a first transparent strip member having a graduated scale thereon and a second transparent strip member having a reference mark thereon, light means capable of generating a light beam which is directed through each of said transparent members towards the eyes of the person to be tested, means for polarizing the beams of light

directed through said first and second transparent members in crossed directions, a first means for analyzing light polarized in said first direction and a second means for analyzing light polarized in said second direction being provided for the respective eyes of the person being tested, means slidably mounting one of said transparent members, and operating means controlled by the person being tested for effecting movement of said one slidably mounted member and causing the displacement of said reference mark along said graduated scale to bring said reference mark into alignment with a particular graduation of said graduated scale as viewed by the person being tested, and means responsive to the sliding movement of said one slidably movable member to assimilate the displacement and alignment of said reference mark along and relative to said graduated scale on a second scale remote from said first scale for remote viewing by an operator.

4,411,502

OPHTHALMOLOGICAL INSTRUMENT FOR EXAMINATION OF ANTERIOR AND POSTERIOR PORTIONS OF THE EYE

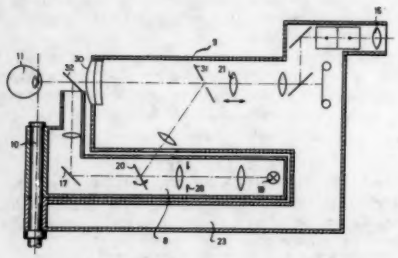
Walter H. Lang; Franz Muchel, both of Konigsbronn; Kurt Schulz, and Gunther Summerer, both of Oberkochen, all of Fed. Rep. of Germany, assignors to Carl Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Nov. 12, 1980, Ser. No. 206,066

Claims priority, application Fed. Rep. of Germany, Nov. 13, 1979, 2945744

Int. Cl.³ A61B *3/14*

U.S. Cl. 351—206 **6 Claims**



1. An ophthalmological instrument having selective capability for examining anterior and posterior portions of the eye, comprising a fundus-camera optical system, a slit-lamp optical system, and means mounting both said systems for independent and selective displacement about a single axis of rotation, said fundus-camera optical system having a first optical axis normal to said axis of rotation and including an objective and other optical elements at radial offset from said axis of rotation, said slit-lamp optical system having a light source and optical elements on a second optical axis normal to said axis of rotation and at axial offset from the geometrical plane swept by said first optical axis upon fundus-camera system displacement about said axis of rotation, first mirror elements forming part of said slit-lamp optical system and folding said second optical axis into said geometrical plane and within said radial offset, the mirror element at said geometrical plane being partially reflecting and being forward of the objective, whereby said fundus-camera system may be operative when both said systems are in a single geometrical plane which includes said axis of rotation, and second mirror elements for folding light from said source from said second optical axis to said first optical axis when said first and second optical axes are in said single geometric plane which includes said single axis of rotation, said second mirror elements including (i) a fixed partially reflecting mirror on said first optical axis and behind said objective and (ii) a movable mirror on said second optical axis, said movable mirror being selectively movable into and out of folding relation with light from said source.

4,411,503

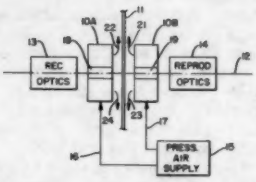
AIR-PLATEN BEARING

David C. Bailey, Cocoa Beach, Fla., and Robert E. Klein, Quincy, Ill., assignors to Harris Corporation, Melbourne, Fla.

Filed May 23, 1978, Ser. No. 908,729

Int. Cl.³ G03B *1/52*

U.S. Cl. 352—222 **16 Claims**



1. An apparatus for supporting a substantially planar-shaped medium in a frictionless manner comprising:

first and second fluid bearing elements, to which a fluid to be directed against respective opposite surfaces of said medium is supplied, disposed adjacent to, but spaced apart from, the opposite surfaces of said medium; and

means for supplying said fluid to said first and second fluid bearing elements; and wherein

each of said fluid bearing elements comprises a material which is thermodynamically non-throttling from the location at which fluid is supplied to said material to the location from which fluid exits said material and is directed against a respective side of said medium.

4,411,504

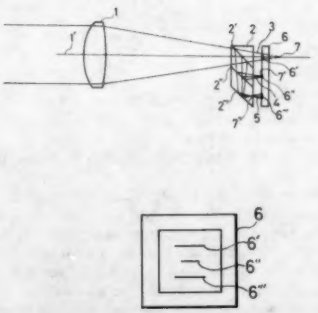
FOCUS DETECTING SYSTEM

Takao Kinoshita, Tokyo; Kazuya Hosoe, Kunitachi, and Masayoshi Yamamichi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1981, Ser. No. 313,583

Int. Cl.³ G03B *7/08*

U.S. Cl. 354—25 **26 Claims**



1. A focus detecting system for detecting a focusing state of an imaging optical system on an object, comprising:

(A) first, second and third radiation-sensitive sections disposed at positions substantially corresponding to positons on, in front of and behind, respectively, a predetermined focal plane of said imaging optical system to receive an object image formed by said imaging optical system, said first, second and third radiation-sensitive sections having

radiation-sensitive surfaces of definite areas and generating electric signals according to an image formation state of the received image; and

(B) processing circuit means for processing the electric signals generated by said first, second and third radiation-sensitive sections to generate an output signal representing the focusing state of said imaging optical system on the object, wherein a substantial field of view for detection of said first radiation-sensitive section is disposed at the position substantially corresponding to the predetermined focal plane to receive the image being narrower than the detecting fields of view of said second and third radiation-sensitive sections.

4,411,505

CAMERA

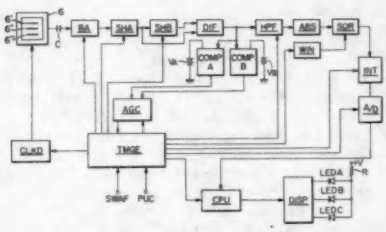
Shinji Sakai; Nobuhiko Shinoda, both of Tokyo; Kazuya Hosoe, Kunitachi, and Takao Kinoshita, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 16, 1982, Ser. No. 358,537

Claims priority, application Japan, Mar. 31, 1981, 56-47613

Int. Cl.³ G03B 3/10

U.S. Cl. 354—25 **26 Claims**



1. A camera, comprising:

focusing adjustable lens means for forming an image of an object on a predetermined focal plane;

an exposure system for exposing a film disposed at said focal plane to light from said lens means;

a focus detecting system for detecting the focus state of said lens means with respect to the object, said focus detecting system including:

signal integration type image sensing means being arranged to receive light from said lens means, said sensing means having a plurality of sensing elements for producing electrical signals representative of the integration of intensity of respective light distribution portions during a controlled signal integration time;

circuit means for processing the electrical signals provided by said image sensing means to produce an output indicative of the focus state of said lens means with respect to the object; and

signal integration time control means for controlling said signal integration time of said image sensing means; and

inhibit means associated with said exposure system, for inhibiting the change of said signal integration time controlled by said signal integration time control means in response to the film exposure operation of said exposure system.

4,411,506

PHOTOGRAPHIC CAMERA

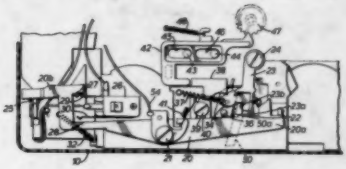
Lian T. Yang, Singapore, Singapore, assignor to Hallmark Camera Mfg. Pte. Ltd., Singapore, Singapore

Filed Nov. 18, 1981, Ser. No. 322,702

Claims priority, application United Kingdom, Nov. 20, 1980, 8037337

Int. Cl.³ G03B 1/12, 15/05

U.S. Cl. 354—145 **19 Claims**



1. A camera for use with a film cassette containing film having perforations indicative of film position, the camera comprising a shutter, an electric motor arranged to wind on film contained in the film cassette when inserted in the camera, a power supply for said electric motor, a shutter priming means for priming said shutter, said shutter priming means being responsive to the passing of a perforation during wind on of the film to prime said shutter, switch means responsive to said shutter priming means being in a primed state to disconnect power from said power supply to said electric motor, and a trigger means responsive to the absence of a film cassette in the camera to transmit drive from said electric motor to prime said shutter priming means.

4,411,507

POSITION CONTROL DEVICE FOR MOVABLE MEMBER

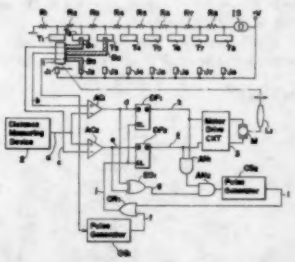
Takashi Kondo, Izumi, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jul. 16, 1982, Ser. No. 398,950

Claims priority, application Japan, Jul. 28, 1981, 56-118797

Int. Cl.³ G03B 3/10, 9/02, 5/01

U.S. Cl. 354—195 **8 Claims**



1. A position control device comprising:

a movable member movable along a predetermined path;

means for moving said movable member;

signal generating means for generating a first analog signal corresponding to a target position where said movable member is to be stopped;

position conversion means for converting the position of said movable member into second and third analog signals being discrete from one another and corresponding to the position of said movable member; and

control means for comparing said second and third analog signals with said first signal for control of said moving

means, said control means generating a stop signal for stopping said moving means when said movable member is driven to a position where said second and third analog signals sandwich said first analog signal.

4,411,508

ANNUNCIATOR FOR A FOCUS ADJUSTING DEVICE

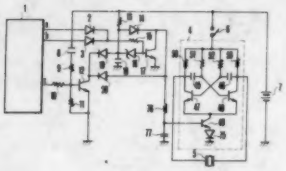
Jiro Kazumi, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 7, 1981, Ser. No. 291,091

Claims priority, application Japan, Aug. 19, 1980, 55-114198

Int. Cl.³ G03B *13/02*

U.S. Cl. 354—198 **4 Claims**



1. An annunciator for a focus adjusting device for informing an operator of the in-focus state of lens means, said focus adjusting device comprising:

focus detecting means for detecting the focusing condition of the lens means with respect to an object and for producing an output indicative of a focus condition;

a servomechanism for driving said lens means in response to the output of said focus detecting means to bring it into focus;

control means responsive to the output of said focus detecting means for actuating said annunciator when said lens means is in the in-focus state, said control means including filter means for eliminating a fluctuation of the output of said focus detecting means produced by the movement of said lens means relative to the object in the vicinity of the in-focus position, whereby a fluctuation of the annunciation of said annunciator is suppressed.

4,411,509

TAKE-UP ASSEMBLY FOR AUTOMATIC FILM LOADING OF CAMERA

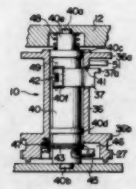
Hitoshi Shirai, Sagamihara, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,587

Claims priority, application Japan, Feb. 13, 1981, 56-19422[U]

Int. Cl.³ G03B *1/04*

U.S. Cl. 354—212 **7 Claims**



1. A take-up assembly for automatic film loading of camera, comprising:

a sleeve having a notch window formed therein for receiving a film catch member therein and adapted to rotate to take up a perforated film therearound in response to a rotating drive transmitted thereto;

a spool shaft rotatably fitted inside the spool sleeve and supported within a camera body;

friction means for providing a resistance of a given magnitude to the rotation of the spool shaft with respect to the camera body;

a film catch member mounted on the spool shaft so as to be exposed through the notch window formed in the spool sleeve and having a pawl for fitting engangement with one of perforations formed in the perforated film, the catch member initially having its pawl engaged with one of the perforations and subsequently being received inside the notch window by the action of a tension in the film which is produced as the spool shaft rotates;

a first spring normally urging the catch member in a direction to permit the pawl to move away from the spool shaft and to project through the notch window;

a second spring disposed between the spool sleeve and the spool shaft to provide a connection therebetween, and operative, during times other than a film loading operation, to urge the spool sleeve to rotate through a given angle relative to the spool shaft in a direction opposite from a film take-up direction so that part of the spool sleeve constrains the catch member to maintain it inside the notch window against the resilience of the first spring; and

engaging means responsive to a rotating drive applied to the spool sleeve in order to take up the film, by causing the spool sleeve to rotate through the given angle in the film take-up direction against the resilience of the second spring to thereby release the constraint exerted upon the catch member by the spool sleeve and to allow the catch member to rotate under the resilience of the first spring until it reaches a position where it is engageable with one of the perforations, the engaging means subsequently acting to cause an integral rotation of the spool sleeve and the spool shaft.

4,411,510

APPARATUS FOR COMPENSATING FOR THE REBOUNDING OF AN AUTOMATIC DIAPHRAGM IN A PHOTOGRAPHIC OBJECTIVE

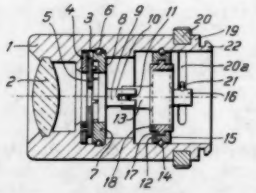
Rudi Faatz, Heuchelheim; Siegfrid Moeller, Eichenzell; Friedel Ruehl, and Adolf Steuernagel, both of Wetzlar, all of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

Filed Dec. 22, 1981, Ser. No. 333,339

Claims priority, application Fed. Rep. of Germany, Jan. 9, 1981, 3100376

Int. Cl.³ G03B *9/07*

U.S. Cl. 354—272 **9 Claims**

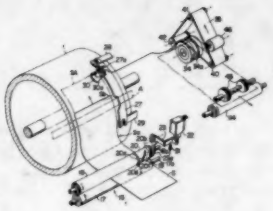


1. Apparatus for at least partially compensating for the rebound impact of an automatic diaphragm in a photographic objective having a diaphragm preselector ring with a stop for preselecting the diaphragm opening and a diaphragm control ring for driving the leaves of the automatic diaphragm, said compensating apparatus comprising at least one movable auxiliary means frictionally engaging an element of said objective and set in motion in response to movement of said diaphragm control ring for counteracting said rebound impact by friction, whereby the energy of movement of said diaphragm control ring is at least partially dissipated by friction.

4,411,511
IMAGE TRANSFER MATERIAL SEPARATION AND TRANSPORTATION APPARATUS FOR ELECTROPHOTOGRAPHIC COPYING APPARATUS

Kenzo Ariyama, Yokohama, and Akira Hirose, Tokyo, both of Japan, assignors to Ricoh Company, Ltd., Japan

Continuation-in-part of Ser. No. 213,650, Dec. 5, 1980, abandoned. This application Dec. 22, 1980, Ser. No. 219,258
Claims priority, application Japan, Dec. 20, 1979, 54-165920; Jan. 22, 1980, 55-006392[U]; Jan. 25, 1980, 55-007590
Int. Cl.³ G03G *15/14, 15/22*
U.S. Cl. 355—3 TR **71 Claims**



1. An image transfer material separation and transportation apparatus for an electrophotographic copying apparatus, which comprises:

a photoconductor for forming an electrostatic latent image or a visible image thereon, which is transferred to an image transfer material;

a corner bending means for bending only a leading edge corner of said image transfer material,

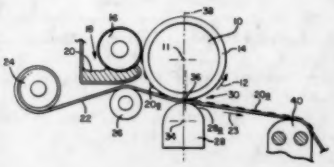
said corner bending means including a bent-blade roller provided with a bent blade at the peripheral surface thereof for bending said edge corner, and a receiving roller having a peripheral surface into which said bent blade is pressed through said image transfer material when turning up said edge corner, and

an image transfer material catching and separation apparatus for catching said edge corner after it has been bent so as to be away from the surface of said photoconductor and for separating said image transfer material from the surface of said photoconductor when said image transfer material is moved in uniformly close contact with said photoconductor, except for said leading edge corner, after image transfer to said image transfer material.

4,411,512
MAGNETIC TONER TRANSFER APPARATUS

Gilbert D. Springer, Sunnyvale, Calif., assignor to Ferix Corporation, Sunnyvale, Calif.

Filed May 26, 1982, Ser. No. 381,924
Int. Cl.³ G03G *15/00, 15/16*
U.S. Cl. 355—3 TR **17 Claims**



1. In a toner transfer system of the type useable with a magnetic image-storage medium having a magnetizable facial expanse transportable along a first known path, a magnetically attractable toner and a toner-adherable receiving medium transportable along a second known path, a portion of which is adjacent said first path, apparatus for transferring toner adhering to a magnetic image stored in such an expanse to such a receiving medium comprising

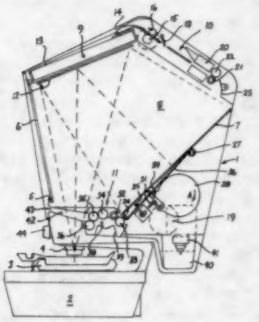
means for pressing the receiving medium against the expanse in the region where such paths are adjacent and establishing thereby at least one line of contact which defines a boundary between a region of contact and a region of noncontact between the receiving medium and the expanse, and

means for producing a magnetic field in the expanse and receiving medium, which field originates from at least one magnetic pole disposed on an opposite side of such a receiving medium relative to such an expanse, in such a manner whereby the field is asymetrical with respect to said line of contact, and the stronger portion of the field exists in the region of noncontact.

4,411,513
READER-PRINTER

Paul M. James, London, England, assignor to Imaging Technology Limited, London, England

Filed Feb. 26, 1981, Ser. No. 238,584
Claims priority, application United Kingdom, Mar. 5, 1980, 8007499
Int. Cl.³ G03G *15/02, 15/22*
U.S. Cl. 355—5 **10 Claims**



1. A reader-printer comprising a housing having a screen on which an image of a film is projected, and an electrophotographic print facility within the housing for producing a print on a copy sheet of an image projected on the screen which print facility comprises a charging station, an exposure station including said screen and a development station with the path for a copy sheet through the housing extending downwardly from the charging station to the exposure station and downwardly from the exposure station to an inlet of the development station, said facility having mechanical means for feeding a copy sheet from a copy sheet inlet of the housing through the charging station to be uniformly electrostatically charged therein and electrically insulated means issuing said sheet into said exposure station, said exposure station having guide means to allow the uniformly charged copy sheet to drop, under the influence of gravity, from the charging station into a desired exposure position on said screen in the exposure station prior to the formation of the charge image thereon, means to displace said sheet from the exposure station to the inlet of the development station after said charge image formation, said inlet being defined by the nip between a pair of normally non-rotating confronting rollers disposed below the lower end of the exposure station, delay means to initiate rotation of the confronting rollers after a time delay to allow the leading end of the copy sheet to drop against the upstream side of said nip, and mechanical means for feeding the displaced sheet from the nip through said development station.

4,411,514
VARIABLE MAGNIFICATION ELECTROPHOTOGRAPHIC COPYING APPARATUS

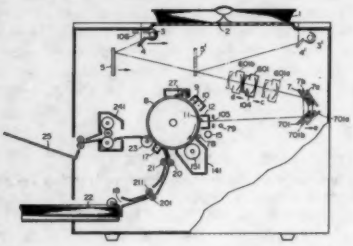
Shigehiro Komori, and Hiroshi Ogawa, both of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 21, 1980, Ser. No. 141,922

Claims priority, application Japan, Apr. 24, 1979, 54/51128; Oct. 23, 1979, 54/136839; Nov. 28, 1979, 54/154076

Int. Cl.³ G03G *15/02*

U.S. Cl. 355—14 CH **55 Claims**



1. An electrophotographic apparatus capable of copying an original selectively at different magnifications, comprising:

a movable electrophotographic photosensitive member;

discharge means for imparting discharge to said photosensitive member to render said photosensitive member into a potential condition capable of forming an electrostatic latent image;

scanning means for scanning said original;

optical means for forming an optical image of said scanned orginal on said photosensitive member at a selected magnification to form an electrostatic latent image, said optical means including at least one optical element which is mounted for movement to change the magnification;

photosensitive member velocity changing means for changing the velocity of movement of said photosensitive member in correspondence with the selected magnification; and

control means for varying the quantity of discharge per unit time of said discharge means to said photosensitive member in correspondence with the selected magnification;

wherein said photosensitive member moves at the speed V_1 when the magnification is m_1, said velocity changing means changes the velocity of said photosensitive member to V_2, which is smaller than V_1, when the magnification is m_2, and said control means decreases the quantity of discharge per unit time when the magnification is m_2, as compared with the quantity when the magnification is m_1.

4,411,515
VERY HIGH SPEED DUPLICATOR WITH LIMITLESS FINISHING FUNCTION

William P. Kukucka, Webster; Frank R. Hynes; Hugh L. Jones, both of Rochester, and David M. Thompson, Fairport, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 180,073, Aug. 21, 1980, Pat. No. 4,358,197. This application Apr. 30, 1982, Ser. No. 373,779

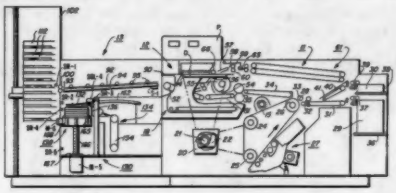
Int. Cl.³ G03G *15/00*

U.S. Cl. 355—14 SH **4 Claims**

4. In a reproduction system for producing copies from a set of document sheets of a multi-page document including an image processor for producing copy sheets and a finishing apparatus whereat copy sheets of the document are collected, the improvement comprising,

program means for presetting the number of copies of the document to be made by the processor during a reproduction run and to condition the system for producing selectively the copies in bound copy sets, unbound copy sets or stacking,

a copy set receiving means arranged to collect the copies in a pile either as a plurality of bound copy sets, unbound copy sets or in stacks, until a plurality of copy sets of a predetermined number has been collected, and



control means responsive to said program means and cooperable with said copy set receiving means for arranging said copies in said pile in offset relationship while the apparatus is producing only unbound copy sets or stacks.

4,411,516
ORIGINAL ILLUMINATION APPARATUS

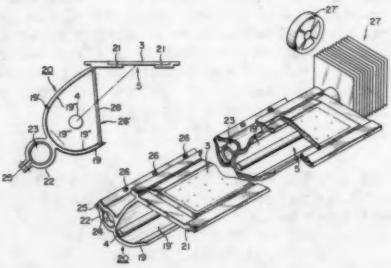
Hiroyuki Adachi, Tokyo, and Shinnosuke Tanlishi, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 6, 1982, Ser. No. 366,067

Claims priority, application Japan, Apr. 24, 1981, 56-60319[U]; Apr. 24, 1981, 56-60320[U]; Apr. 24, 1981, 56-60321[U]

Int. Cl.³ G03B *27/54, 27/52*

U.S. Cl. 355—67 **14 Claims**



1. Apparatus for illuminating an original whose optical image is to be formed on a photosensitive surface through an image forming optical system, said original illumination apparatus, comprising:

a transparent member through which the original is opposed to said image forming optical system;

light source means for emitting light to illuminate the original, said light source means being fixed relative to said transparent member;

heat transmission means having, as its integral parts, a transparent supporting part for fixedly supporting said transparent member and a light reflecting part for reflecting a portion of the emitted light from said light source means so as to illuminate the original by the reflected light; and

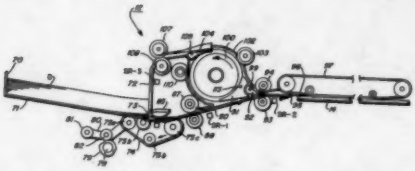
heat pipe means for depriving said heat transmission means of heat thereby cooling it.

4,411,517

VERY HIGH SPEED DUPLICATOR WITH DOCUMENT HANDLING

William G. Gerken, Pittsford, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 23, 1981, Ser. No. 314,801
Int. Cl.³ G03G 15/00
U.S. Cl. 355—14 SH 7 Claims



1. In a reproduction machine having a document handling apparatus for feeding document sheets individually from a stack to an exposure platen for the machine and return to the stack for selective repeated copying of one side only or both sides of the document sheets, with the sheets in the stack being arranged in sequential order, and wherein the apparatus includes the improvement comprising:

a document support member adjacent to one side of the platen for supporting the stack, said support member having means for feeding each document sheet from the bottom of the stack associated therewith,

means defining a sheet path from the document sheet feed means to the platen without inverting the sheet,

means defining a sheet path from the platen for inverting the sheet and to return the sheet to the platen in an inverted orientation thereby presenting the first side of the sheet for copying,

deflector means being movable to an operative position for directing the document sheet from said support member to the platen or movable to another operative position to return the sheet to the top of the stack in an inverted orientation, and

control means for selectively actuating said deflector means to either of said operative positions.

4,411,518

APPARATUS FOR USE IN QUALITATIVE DETERMINATION OF IMMUNOLOGICAL REACTIONS

Peter M. Meserol, Montville, and Jesse L. Acker, Rockaway, both of N.J., assignors to Gamma Biologicals, Inc., Houston, Tex.

Division of Ser. No. 835,996, Sep. 23, 1977, Pat. No. 4,197,088.
This application Nov. 26, 1979, Ser. No. 97,195
Int. Cl.³ G01N 21/03, 33/48
U.S. Cl. 356—39 30 Claims

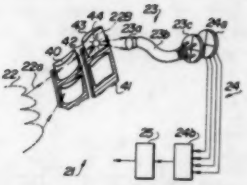
25. An image cell for fluid reactants, said image cell comprising a pair of opposed, parallel planar surfaces bonded to each other, a generally circular indentation in each of said opposed surfaces so as to define a reaction cell, and an aperture in one of said indentations for introducing the fluid reactants into said reaction cell, wherein said indentations are sufficiently recessed so as to permit the fluid reactants to freely move within said cell while said cell is rotated and wherein said reactants remain confined without issuing from said cell during such rotation.

4,411,519

METHOD OF AND SYSTEM FOR MEASURING TEMPERATURE AND SPECTRAL FACTOR

Ichizo Tagami, Hachioji, Japan, assignor to Ishikawajima-Harima Heavy Industries Co., Ltd., Tokyo, Japan

Filed Aug. 27, 1980, Ser. No. 181,745
Claims priority, application Japan, Aug. 28, 1979, 54-109346; Sep. 15, 1979, 54-118330; May 29, 1980, 55-71780; Jun. 2, 1980, 55-73908; Jun. 16, 1980, 55-81057; Jun. 30, 1980, 55-88844
Int. Cl.³ G01J 5/60; G01N 21/27
U.S. Cl. 356—45 10 Claims



1. A method of measuring the temperature and a spectral factor of a specimen, comprising the steps of:

spectrally separating a radiant flux from said specimen with respect to effective wavelengths for n ($n \geqq 3$) different channels;

converting the intensities of the respective spectrally separated radiant fluxes into corresponding electric detection values;

obtaining electric values for effective wavelengths for m ($n \geqq m \geqq 3$) different channels selected from said electric values for effective wavelengths for n channels;

approximating spectral factors with respect to said effective wavelengths for said m different channels with an $(m-2)$-th order polynomial representing the effective wavelengths, thereby obtaining the temperature of said specimen from said electric detection values for said effective wavelengths for said m different channels; and

obtaining the spectral factor of said specimen from said obtained temperature and said electric detection values for said effective wavelengths for m channels.

4,411,520

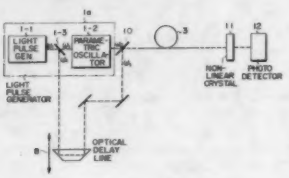
LIGHT DISPERSION MEASURING APPARATUS

Kiyofumi Mochizuki, Yokohama; Hiroharu Wakabayashi, Kawasaki, and Yasuhiko Niiro, Yokohama, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 7, 1981, Ser. No. 222,973
Claims priority, application Japan, Jan. 14, 1980, 55-2872
Int. Cl.³ G01N 21/00
U.S. Cl. 356—73.1 3 Claims

1. A light dispersion measuring apparatus comprising: a light source for generating reference light pulses each having a short duration and at a constant frequency and generating variable-frequency light pulses in synchronization with the reference light pulses and at a different frequency than the reference light pulses, a variable optical delay line for receiving and delaying the reference light pulses, an optical light transmission medium the light dispersion characteristic of which is to be measured and to which the variable-frequency light pulses and delayed reference light pulses from the optical delay line are applied, an optical nonlinear effect element for receiving

the output light pulses from the optical transmission medium disposed so that when timing of the delayed reference light pulses and the variable frequency light pulses coincide with each other, a sum of the light of coincident pulses is at a maximum sum light intensity in in output pulses from the optical nonlinear effect element, a photo detector receptive of the



last-mentioned output pulses for detecting the value of the sum light intensity thereof, and the light dispersion characteristic in the optical transmission medium is measured from the delay of the variable optical delay line when adjusted so that said maximum light intensity occurs with respect to the frequency of the variable-frequency light pulses.

4,411,521

OPTOELECTRIC DETECTION DEVICE ESPECIALLY FOR LASER RADIATION

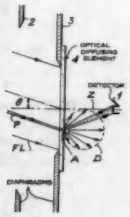
Francis Jourdan; Patrice Marquet, and Francois Ternant, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Jun. 3, 1980, Ser. No. 156,087

Claims priority, application France, Jun. 8, 1979, 79 14718

Int. Cl.³ G06J *1/42*

U.S. Cl. 356—225 **6 Claims**



1. An optoelectric incident radiation detection device applicable in particular to detecting a beam of incident laser radiation comprising:

optical means for receiving the incident radiation from the observed field which observed field is centered on the optical axis of said optical means; and

photodetection means comprising at last one photodetector element having a receiving surface for detecting the radiation transmitted via said optical means for receiving to said receiving surface;

said optical means for receiving being formed by a set of two diaphragms for delimiting said field of observation and by means for diffusing the radiation passed by said two diaphragms and incident on said means for diffusing so that a fraction of the light energy transported by any beam of radiation incident on said means for diffusing is directed to the receiving surface of said photodetection means, said means for diffusing being constituted by a diffusing paint applied on a surface of mechanical part, the diaphragms and the receiving surface of the photodetection means being located on the same side of the diffusing means.

4,411,522

APPARATUS FOR THE INSPECTION OF TRANSLUCENT CONTAINERS

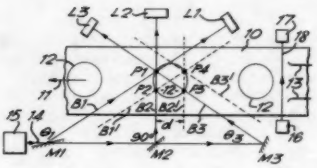
Brendan F. O'Connor, Foxrock; John O. Phillips, Ballyvourney, and Charles M. Webb, Foxrock, all of Ireland, assignors to Udaras Na Gaeltachta, Furbo, Ireland

Filed Mar. 30, 1981, Ser. No. 248,154

Claims priority, application Ireland, Mar. 28, 1980, 650/80; Aug. 6, 1980, 1636/80; Nov. 4, 1980, 2279/80

Int. Cl.³ G01N *21/90*

U.S. Cl. 356—240 **11 Claims**



11. An apparatus for the inspection of translucent containers, the apparatus comprising:

means for transporting successive containers through an inspection zone;

means for directing at least one light beam sideways at each container in the inspection zone;

deflecting means for causing the light beam to repeatedly scan the side of the container in a direction transverse to the direction of motion of the container in the inspection zone;

an opto-electronic light collector for providing a signal representing the amount of light falling thereon from the light beam after transmission through the container;

signal processing circuitry associated with the light collector and adapted to examine the signal therefrom according to a predetermined criterion to generate a fault-indicating signal when such criterion is fulfilled;

means allocating to the light beam a respective area of the container sidewall for which any such fault-indicating signal can be regarded as resulting from an actual fault rather than from a characteristic of an acceptable container, said area allocating means comprising a storage means having stored therein binary information identifying those regions (referred to herein as fault-invalid regions) of an acceptable container, as viewed in the direction of the beam, from which fault-indicating signals may be generated according to the said criterion, the contents of the storage means being the cumulative result of previously scanning a large number of containers which have been determined to be acceptable and storing each fault-indicating signal so generated as a significant bit in the storage means at an address corresponding to the position of the beam relative to the container; and

suppression means responsive to the stored binary information to suppress any fault-indicating signal generated while scanning a fault-invalid region of the container.

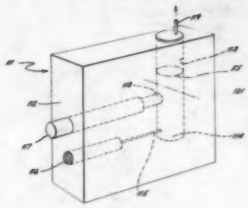
4,411,523
CUVETTE FOR BLOOD OXYGEN ANALYSIS APPARATUS

Horst K. Blume, Huntingdon Valley, and Toshio Asakura, Bala Cynwyd, both of Pa., assignors to Technical Consulting Services, Southampton, Pa.

Continuation-in-part of Ser. No. 28,790, Apr. 11, 1979, Pat. No. 4,304,488, which is a continuation-in-part of Ser. No. 845,686, Oct. 26, 1977, abandoned. This application Dec. 7, 1981, Ser. No. 328,057

Int. Cl.³ G01N *33/48, 21/03*

U.S. Cl. 356—246 **4 Claims**



1. An improved cuvette for use in blood oxygen association analysis comprising:

a generally rectangular block of transparent material having a downwardly-extending cavity therein,

an oxygen partial pressure electrode seated in said block and having its sensitive probe end extending to the interior of the cavity,

a gas inlet formed in said block including a small-bore passage extending substantially horizontally into communication with the wall of said cavity adjacent to the bottom thereof for introduction of an exchange gas into the contents of the cavity and for agitation of its contents, and

gas vent means at the top of said cavity for venting gas therefrom as new gas is being introduced through the gas inlet port in said block.

4,411,524
APPARATUS FOR THE SPECTROMETRIC ANALYSIS OF THE CHEMICAL COMPOSITION OF METALLIC PARTS

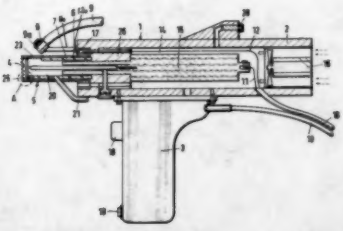
Karl J. Kremer; Jochen Brauner, both of Siegen; Klaus-Dieter Glaubitz, Hilchenbach; Helmut Eckstein, and Josef Bruggemann, both of Wenden, all of Fed. Rep. of Germany, assignors to Krup Stahl, A.G., Bochum, Fed. Rep. of Germany

Filed Jun. 15, 1981, Ser. No. 273,681

Claims priority, application Fed. Rep. of Germany, Jul. 31, 1980, 3029038

Int. Cl.³ G01N *21/67*

U.S. Cl. 356—313 **9 Claims**



1. Apparatus for the spectrometric analysis of the chemical composition of metallic parts comprising a probe designed to be placed on the metallic part, said probe having a device for vaporizing said part, means for spacing said device from said part, and means for sensing the radiation of metallic vapor brought to luminescence by said vaporizing device,

characterized in that, said means for spacing said device from said part comprises a chamber containing said device and provided with an open end;

said vaporizing device being a spark electrode coupled to a power source and said chamber as contact bridge for transferring the current of said power source;

said open end of said chamber designed to be placed on said part and provided with a plurality of serrations;

a window formed in said chamber, with said sensing means positioned adjacent said window and on the outside of said chamber;

a tubular member communicating with said chamber for admitting a protective gas into said chamber; and a number of nozzles arranged about the outside of said chamber to direct a coolant thereat.

4,411,525
METHOD OF ANALYZING AN OBJECT BY USE OF SCATTERING LIGHT

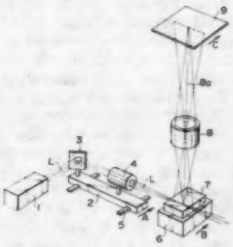
Tomoya Ogawa, Tokyo, Japan, assignor to Fuji Photo Optical Co., Ltd., Japan

Continuation of Ser. No. 9,496, Feb. 5, 1979, abandoned. This application Aug. 11, 1981, Ser. No. 291,935

Claims priority, application Japan, Feb. 8, 1978, 53-13293

Int. Cl.³ G01N *21/49*

U.S. Cl. 356—339 **11 Claims**

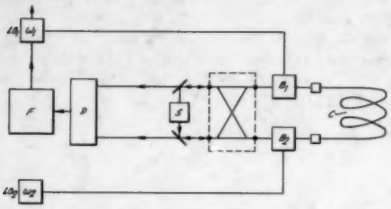


1. A method of analyzing the internal structure of an object along a desired cross-section comprising steps of causing a light beam transmitting through a desired cross-section of an object to be analyzed, causing the object to move in a direction intersecting with the direction of the light beam so that the plane including said light beam becomes said desired cross-section, creating scattering light which carries information of the internal structure along the path of the light beam transmitting through the object to scan along said cross-section, consecutively observing the scattering light along an optical axis intersecting with said cross-section, and consecutively recording the observed scattering light on a recording medium which is moved in synchronization with the scanning of the light beam, whereby the internal structure of the object is analyzed along said cross-section by summing all the information of the scattering light obtained by the scanning of the light beam.

4,411,526
MEASUREMENT OF ROTATION RATE USING SAGNAC EFFECT

Martin Chown, Harlow, and Jeffrey G. Farrington, Bishop's Stortford, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Continuation of Ser. No. 219,557, Dec. 23, 1980, abandoned.
This application Apr. 29, 1983, Ser. No. 487,997
Claims priority, application United Kingdom, Jan. 17, 1980, 8001512
Int. Cl.³ G01B *9/02*; G01C *19/64*
U.S. Cl. 356—350 **2 Claims**



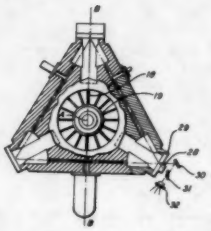
1. An optical fibre coil Sagnac effect rotation rate measuring instrument, comprising an optical commutating switch including a first, and a second pair of ports, said first ports being optically connected with said second ports in such a way that operation of the switch interchanges the connection between the members of the first pair of ports and those of the second pair, an optical fibre Sagnac coil consisting of a plurality of turns of single mode fibre, two controllable optically non-reciprocal elements, a laser source emitting two phase related beams of light, means for individually directing each of the two phase related beams of light in a separate path towards a different one of said first ports and then through said switch and through the respective non-reciprocal element into the coil for the two beams to travel through the latter in opposite directions and to return through the switch, means for mixing the returning beams, means for detecting the interfering beams including a photodetector having an output, a feedback control circuit having an input connected to the output of the photodetector and an output, the paths of the two beams having such different lengths that in the absence of any rotation of the coil the two beams at the photodetector are separated by a phase angle substantially different from 0 and from π, and an oscillator controlling the operation of the switch, said oscillator being operable at a frequency equal to or a multiple of the reciprocal of the propagation time through the Sagnac coil whereby light launched into the coil when the switch is in either one of its two conditions emerges from the coil to return through the switch when once again the switch is in the same condition, and the feedback control circuit being constructed to control the non-reciprocal elements in such a way as to minimize any a.c. component of the output of the photodetector in phase or in antiphase with the switching of the commutating switch.

4,411,527
RING LASER GYROSCOPE WITH COMPENSATION

George R. Gamertsfelder, Pleasantville, N.Y., and Bo Hans G. Ljung, Wayne, N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Jan. 29, 1981, Ser. No. 278,767
Int. Cl.³ G01C *19/64*
U.S. Cl. 356—350 **3 Claims**

1. A ring laser gyro including:
(a) a block having a triangularly shaped laser cavity;
(b) lasing means integral with said cavity for producing two counter-rotating beams of monochromatic light;
(c) a reflecting surface at the junction of each leg of said cavity, one of said reflecting surfaces being an output mirror;
(d) a base,
(e) means for centrally supporting said laser cavity on said base for pseudorandom dithering of said cavity,
(f) a detector, and
(g) adjustable optical means adjacent said output mirror for intercepting said two beams of monochromatic light emitted from said cavity and for directing said each of said beams along a predetermined path to said detector, said adjustable optical means being attached exteriorly of said output mirror for deflecting the path of said beams, said adjustable optical means being adapted to form an interferometer having a sensitivity equal and opposite to that of said ring laser gyro when said ring laser gyro is dithered, wherein said adjustable optical means comprises:

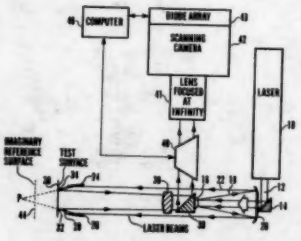


an optical wedge fixedly attached to said output mirror for deflecting the path of one output beam, said optical wedge having a wedge angle, said wedge angle size being a function of the ratio of gyro frequency difference to gyro input angular rate, and
an adjustable turning mirror intercepting the path of the other beam and redirecting it toward said detector; and
a partly transmissive adjustable beamsplitter between said turning mirror and said detector transmitting a part of said other beam and reflecting a part of said one beam onto said detector, whereby an adjustable interference pattern will be formed on said detector.

4,411,528
OPTICAL DISPLACEMENT AND CONTOUR MEASURING

James S. Newcomb, St. Paul, and Charles Eumurian, Mahtomedi, both of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed Jan. 19, 1981, Ser. No. 226,305
Int. Cl.³ G01B *11/00, 11/14*; G02B *5/10*
U.S. Cl. 356—375 **3 Claims**



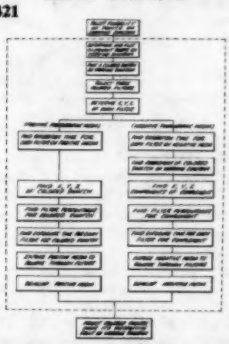
1. Apparatus for optically measuring the distance and obliquity of a surface from a reference surface comprising:
means for providing a collimated beam of light;
a convex reflecting surface center mounted transverse said collimated beam;

a concave surface partially mirrored at a predetermined radius adapted to project a collimated ring of light;
a conical reflection surface center mounted transverse the collimated ring of light and adapted to reflect the collimated ring of light into a converging ring of light;
a test surface intercepting said converging ring of light;
optical means for observing and projecting the image of said ring on said test surface;
means for rotating the image of said ring through 180°;
linear photo diode means for receiving and detecting the projected and rotated image of said ring; and
means for converting the detected image of said ring rotated through 180° into the displacement and obliquity of the test surface from an imaginary reference surface through 360°.

4,411,529
COLOR REFERENCE DATA BASE AND METHOD OF PREPARING SAME

Marjorie D. Ingalls, and Richard D. Ingalls, both of E. 1104 57th, Spokane, Wash. 99203

Division of Ser. No. 76,499, Sep. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 7,702, Jan. 30, 1979, abandoned, which is a continuation-in-part of Ser. No. 794,987, May 9, 1977, abandoned. This application May 21, 1981, Ser. No. 265,995
Int. Cl.³ G01J *3/52*
U.S. Cl. 356—421 **21 Claims**

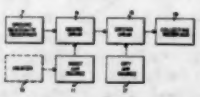


1. A method of preparing a color reference data base in the form of a CIE type diagram comprising the steps of:
(a) selecting a plurality of color points located in a color data working area of the data base by superimposing a grid on the working area and choosing various intersections of the grid as color points;
(b) preparing a colored swatch on photographic media having primary color components the same as the primary color components of each color point so selected; and
(c) placing each colored swatch at its respective color point within the color data working area.

4,411,530
SYSTEM AND METHOD FOR RAPID BENEFICIATION OF BENTONITE CLAY

Philip F. Low, West Lafayette; Charles B. Roth, Battle Ground, both of Ind., and Joseph W. Stucki, Champaign, Ill., assignors to Purdue Research Foundation, West Lafayette, Ind.

Filed Jan. 13, 1982, Ser. No. 339,098
Int. Cl.³ B01F *3/06*
U.S. Cl. 366—4 **15 Claims**

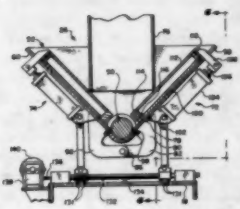


1. A method for rapid beneficiation of bentonite clay, said method comprising subjecting bentonite clay to moist air while said bentonite clay is being agitated to increase the rate of oxidation of ferrous iron in sand bentonite clay.

4,411,531
EXTRUDER ASSEMBLY

George Holmes, West Chicago, and Frank Keyser, Streamwood, both of Ill., assignors to Thomas R. Vigil, Barrington, Ill.

Filed Oct. 19, 1981, Ser. No. 312,233
Int. Cl.³ B29B *1/06*; B01F *15/02*
U.S. Cl. 366—76 **15 Claims**

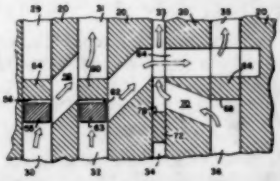


1. In an extruder assembly including a barrel, a screw received within said barrel, drive means connected to one end of said screw for driving same, a slot in said barrel, feeding means associated with said slot for feeding material through said slot into said extruder barrel, and extruding means at the other end of said barrel through which material is forced by said screw, the improvement residing in said feeding means comprising at least one ram feed assembly including a ram plate positioned at one side of said slot in said barrel and a ram positioned for movement on the upper surface of said ram plate, means for moving said ram plate between an upper position where said ram plate forms a material feeding plate and where material is forced by said ram into said slot, and a lower position where said upper surface of said ram plate and said ram are exposed for maintenance and repair.

4,411,532
ROTARY PROCESSOR

Lefteris N. Valsamis, West Haven; Jan-Chin Yang, Huntington, and Gary S. Donoian, West Haven, all of Conn., assignors to USM Corporation, Farmington, Conn.

Filed Jan. 4, 1982, Ser. No. 336,607
Int. Cl.³ B01F *7/10*
U.S. Cl. 366—99 **14 Claims**



1. A rotary processor comprising a rotatable element carrying a plurality of processing channels and a stationary element having a coaxial closure surface operationally arranged with said channels to provide enclosed processing passages and where the processing passages provide a plurality of interconnected processing stages including a first processing stage and a second processing stage having inboard and outboard sections separated by a third processing stage, said first processing stage having at least one passage comprising an inlet, a first-stage material transfer groove and a blocking member associ-

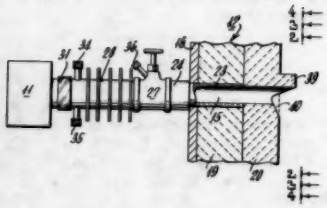
ated with the stationary element and arranged so that material fed to the passage can be blocked and supplied to the transfer groove for transfer to the inboard section of the second processing stage which includes at least one passage adapted to receive material from the first-stage material transfer groove and comprising a blocking member and an inboard section material transfer groove associated with the stationary element and arranged so that material fed to the passage can be blocked and supplied to the inboard section material transfer groove for transfer of material to the outboard section of the second processing stage over an open channel of a third-stage processing passage and where the outboard section includes at least one passage adapted to receive material from the inboard section transfer groove and comprising a blocking member and an outboard section material transfer groove associated with the stationary element and arranged so that material fed to the passage can be blocked and supplied to the outboard section transfer groove for transfer to the third processing stage which includes at least one passage capable of developing discharge pressure and adapted to receive material from the outboard section material transfer groove and comprising a blocking member and an outlet associated with the stationary element and arranged so that material can be blocked and discharged from the passage through the outlet and, means to control discharge of material from the outlet.

4,411,533

SYSTEM FOR MEASURING TEMPERATURE OF HOT GASES LADEN WITH ENTRAINED SOLIDS

Jordan Loftus, and Paul N. Woldy, both of Houston, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Apr. 27, 1981, Ser. No. 258,090
Int. Cl.³ G01J *5/00*
U.S. Cl. 374—125 **1 Claim**



1. In combination with a stationary vessel having vertical walls and containing high temperature gases laden with molten slag,

said slag flowing down the inside of said vertical walls,

a pyrometer for measuring temperature of said gases by radiation,

a horizontal sight hole through one of said vertical walls and above said slag,

a valve, and

an offset spool for mounting said pyrometer to receive said radiation through said sight hole, said valve and said spool,

the improvement comprising a projecting horizontal shelf integral with said inside of said wall and projecting around the top half of said sight hole for diverting said molten slag around said sight hole to keep said sight hole open, and

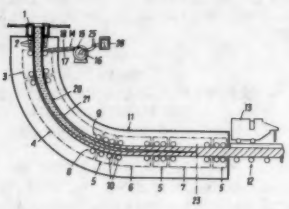
a sloped recess in said wall on said inside thereof and extending from the bottom half of said sight hole for draining said slag away from the bottom edge of said sight hole to keep said sight hole open.

4,411,534

METHOD OF CONTINUOUSLY MEASURING THE TEMPERATURE OF THE SURFACE OF A CONTINUOUSLY CAST STRAND OVER ITS LENGTH

Othmar Kriegner, St. Valentin, and Günther Gruber, Linz, both of Austria, assignors to Voest-Alpine Aktiengesellschaft, Linz, Austria

Filed Jan. 2, 1981, Ser. No. 222,017
Claims priority, application Austria, Jan. 11, 1980, 131/80
Int. Cl.³ G01K *13/06, 7/08*
U.S. Cl. 374—141 **4 Claims**



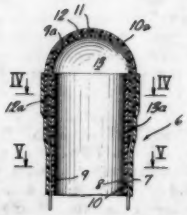
1. In a method of continuously measuring the temperature of the surface of a moving continuously cast strand over its length while the strand is solidifying, in particular a cast strand for steel slabs, in a continuous casting plant including a roller guide, at least one thermoelement having a measuring junction of a thermocouple, conductor means in equalizing conduit means that comprise reference junction means being connected with said measuring junction, which method comprises applying said thermoelement with its measuring junction and thermocouple onto said surface of said strand and moving said thermoelement together with said surface of said strand, the improvement which is characterized in that the measuring junction of said thermoelement is rolled into and substantially flush with said surface of said strand in the longitudinal direction of said strand.

4,411,535

PROBE FOR CLINICAL ELECTRONIC THERMOMETER

Jack Schwarzschild, Stamford, Conn., assignor to Timex Medical Products Corporation, Waterbury, Conn.

Continuation-in-part of Ser. No. 249,779, Apr. 1, 1981, abandoned. This application Oct. 8, 1981, Ser. No. 309,667
Int. Cl.³ G01K *1/18*
U.S. Cl. 374—165 **9 Claims**



1. A probe for an electronic clinical thermometer comprising:

a plastic probe body comprising inner and outer hollow coaxial tubular members of material having a low thermal conductivity and having thin walls of low thermal mass,

a probe tip comprising two plastic cup members each having a substantially hemispherical shape and having a thin wall of low thermal mass, said cup walls not exceeding approximately 0.15 mm in thickness,

a thermistor of low thermal mass,

and a pair of leads of low thermal mass disposed between and supported by the walls of said tubular members and also disposed between and supported by the walls of said cup members and connected to said thermistor at the end of the probe tip between the cup members,

said cup members received between the walls and sealingly connected at the ends of said tubular members and closing off said tubular members at the end of the probe body.

4,411,536

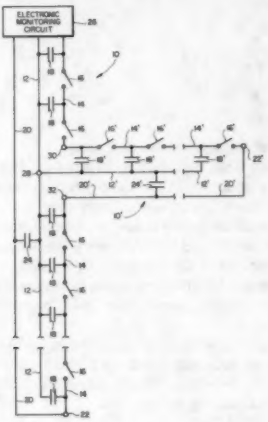
BI-DIRECTIONAL TEMPERATURE EXCURSION SENSING AND LOCATING APPARATUS

Howard B. Kroymann, Menlo Park, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed May 29, 1981, Ser. No. 269,933

Int. Cl.³ G01K *13/00*; G01R *31/08*

U.S. Cl. 374—184 **2 Claims**



1. Temperature excursion sensing and locating apparatus, comprising:

a first electrical conductor in a cable;

a second electrical conductor in said cable comprising a plurality of serially connected, normally conductive, thermostatic devices for detecting temperature excursions, said second electrical conductor thereby having first end and a second end, each of the thermostatic devices becoming non-conductive upon detection of a predetermined temperature excursion;

a dielectric member disposed between first and second electrical conductors, said first and second electrical conductors and dielectric member having an original capacitance value while the thermostatic devices are conductive and a reduced capacitance value upon detection of the predetermined temperature excursion by an opening of a thermostatic device in response to said temperature excursion a first end of said first electrical conductor and the first end of said second electrical conductor selectively connectable to a capacitance measuring device which compares the original and reduced capacitance values to determine the presence of a said predetermined temperature excursion and its distance from the first end of said second electrical conductor; and a third electrical conductor in said cable and having first and second ends, said second end connected to the second end of said second electrical conductor, the first end of said third electrical conductor and the first end of said first electrical conductor being alternately connectable to a capacitance measuring device which compares the original and reduced capacitance values to determine the presence of a predetermined temperature excursion and its distance from the second end of said second electrical conductor, the first end of said third electrical conductor and the first end of said second electrical conductor forming a continuous circuit before said excursion and a discontinuous circuit during said excursions defining a positive temperature excursion detection means independent of capacitance measurement.

4,411,537

ELECTRICAL THERMOMETER FOR MEASURING SURFACE TEMPERATURE (I)

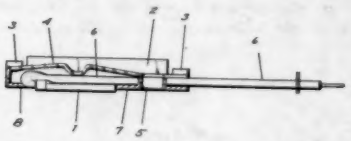
Dieter Grimm, Schoneck, Fed. Rep. of Germany, assignor to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 3, 1982, Ser. No. 354,527

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1981, 8108694[U]

Int. Cl.³ G01K *7/04, 7/16*

U.S. Cl. 374—185 **8 Claims**



1. An electrical thermometer suitable for the measurement of surface temperatures comprising in combination, a flat temperature probe having lead wires and a metal housing, said housing having a housing bottom, a recess in said housing bottom, said recess being larger in width and length than said probe, that depending on the size of the temperature probe there is avoided contact between the temperature probe and the housing, said temperature probe being positioned in the recess by means of spring means secured to the housing, whereby the surface of the temperature probe extends beyond the surface of the housing, said spring means being a leaf spring which is secured to the housing by bent over housing corners.

4,411,538

PRINT-HEAD OF A DOT-PRINTER

Kiyomitsu Asano, Musashino; Toshikatsu Kondo, and Shigeru Mizuno, both of Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi and Nippon Telecommunication Eng. Co., Tokyo, both of, Japan

Filed Aug. 5, 1981, Ser. No. 290,300

Claims priority, application Japan, Aug. 11, 1980, 55-113601[U]

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—124 **10 Claims**

1. A print head adapted to be incorporated into a serial dot-printer comprising:

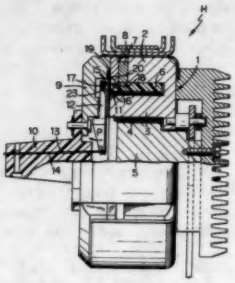
a support member;

a plurality of armatures;

a leaf spring disposed along the longitudinal direction of each of said armatures secured at one end thereof to said support member and at the other end thereof to one end of each respective one of said armatures, each said leaf spring being formed in a middle portion thereof with a perforation;

a wire spring extending through each said perforation at substantially a right angle to each said leaf spring and secured at one end thereof to said support member and at

the other end thereof to said one end of its corresponding one of said armatures;



a print wire secured to the other end of each of said armatures disposed generally perpendicular to the longitudinal direction of its respective one of said armatures; and

drive means selectively driving each of said armatures.

4,411,539

PRINT ELEMENT WITH PLURAL TYPE LAYERS OF VARYING THICKNESS

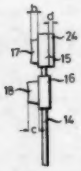
Nobuo Iwata, Sagamihara, and Takashi Hasegawa, Hiratsuka, both of Japan, assignors to Ricoh Company, Ltd., Japan

Filed Dec. 17, 1981, Ser. No. 331,677

Claims priority, application Japan, Dec. 18, 1980, 55-179482

Int. Cl.³ B41J *1/26*

U.S. Cl. 400—144.2 **3 Claims**



1. A print element for use in a printer which prints on paper and has a hammer member and means to move the print element to a predetermined printing position; the print element having a multiplicity of type members arranged in a plurality of layers with each type member carrying a type character on its front face, wherein the print element is moved to a predetermined printing position at which the back face of one type member is struck by the hammer member to print the character carried on its front face; the improvement in the print element being that the thicknesses of the type members are varied from one another, the thicknesses being taken in relationship to an imaginary common base plane perpendicular to the direction of motion of the hammer, such variance in thickness depending upon the layer in which each type member is arranged, the deviation of the center of each type member from the point at which the type member is struck by the hammer, and the vertical dimension of the character carried by the type member; such variance in thicknesses eliminating ghost printing caused by the undesired touching of the paper by the type member adjacent in layer to the type member struck by the member.

4,411,540

PRINTING APPARATUS

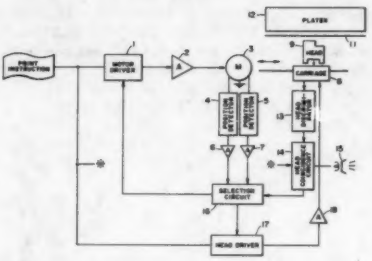
Mineo Nozaki, Kawasaki; Masasumi Nagashima, Yokosuka, and Osamu Asakura, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 18, 1981, Ser. No. 293,878

Claims priority, application Japan, Aug. 27, 1980, 55/116997; Aug. 27, 1980, 55/116998

Int. Cl.³ B41J *3/12*

U.S. Cl. 400—175 **6 Claims**



1. A printing apparatus comprising:

a printing head detachably mounted on a carriage;

discriminating means for identifying a typefont of said printing head mounted on said carriage;

coincidence detecting means for comparing a result of identification by said discriminating means with the typefont information of characters to be printed;

alarm means for giving an alarm in response to a non-coincidence output signal from said coincidence detecting means; and

selection means adapted for selecting either one of plural position detecting means for detecting carriage position in response to a coincidence output signal from said coincidence detecting means.

4,411,541

RIBBON FEED AND ELEVATING MECHANISM FOR TYPEWRITERS OR SIMILAR MACHINES

Manfred Mansfeld, Frankfurt, and Karl Wenderoth, Bad Vilbel, both of Fed. Rep. of Germany, assignors to Triumph-Adler A.G. fur Buro-und Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed Jan. 27, 1982, Ser. No. 343,117

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1981, 3105229

Int. Cl.³ B41J *33/18, 35/14*

U.S. Cl. 400—213 **5 Claims**

1. In a typewriter or like machine having a support frame,

a shaft supported on said frame,

lever means rotatably mounted on said shaft for cyclic movement from a rest position to an active position and return to rest position to effect ribbon feed and elevating,

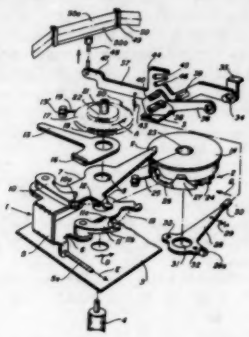
a ribbon feed ratchet mounted on said shaft adapted to be coupled to rotatably drive a ribbon spool,

said lever means including a first pawl for engaging and driving said ribbon feed ratchet incident to cyclic movement of said lever means,

a pivoting lever mounted on said frame and operative to elevate ribbon supported thereby.

a ribbon lift lever rotatably mounted on said shaft coupled to pivot said pivoting lever incident to a cyclic motion of said lever means,

said lever means including a second pawl for driving said ribbon lift lever, and



a control lever pivotally mounted on said frame and coupled to said ribbon lift lever for controlling the movement of said ribbon lift lever imparted to said pivoting lever.

4,411,542

ERROR RIBBON ELEVATION AND TRANSPORT MECHANISM FOR TYPEWRITERS AND SIMILAR MACHINES

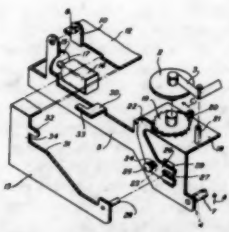
Karl Wenderoth, Bad Vilbel, and Lothar Kuhn, Frankfurt, both of Fed. Rep. of Germany, assignors to Triumph-Adler A. G. fur Buro-und Informationstechnik, Nuremberg, Fed. Rep. of Germany

Filed Oct. 21, 1981, Ser. No. 313,457

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1980, 3048810

Int. Cl.³ B41J *29/36, 33/18*

U.S. Cl. 400—697.1 2 Claims



1. In a typewriter having print and error correction ribbons,

a frame for supporting said print ribbon,

a bridge pivotally mounted on said frame for supporting error correction ribbon supply and take up spools,

an error correction ribbon take up spool feed ratchet rotatably mounted on said bridge,

an electromagnet connected to pivot said bridge when energized thereby to effect elevation of said error correction ribbon,

a pawl pivotally mounted on said bridge for driving said feed ratchet when pivoted,

said pawl having a forked end, and

a pin on said frame extending through said pawl forked end for causing said pawl to pivot into driving engagement with said feed ratchet as said bridge is pivoted by said electromagnet thereby to effect feed of said error correction ribbon.

4,411,543

SELF-FEEDING MECHANICAL PENCIL

Junichi Hashimoto, and Tadayuki Miyagi, both of Tokyo, Japan, assignors to Pentel Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 17, 1980, Ser. No. 198,281

Claims priority, application Japan, Oct. 29, 1979, 54-139645; Dec. 28, 1979, 54-183285[U]; Dec. 28, 1979, 54-183286[U]; Jan. 24, 1980, 55-7356[U]; Jan. 29, 1980, 55-9073[U]; Feb. 28, 1980, 55-25226[U]; Mar. 31, 1980, 55-43037[U]; Apr. 25, 1980, 55-57949[U]; May 31, 1980, 55-75437[U]; Sep. 25, 1980, 55-136270[U]; Sep. 25, 1980, 55-136271[U]

Int. Cl.³ B43K *21/16*

U.S. Cl. 401—53 16 Claims

1. A self-feeding mechanical pencil comprising:

a substantially tubular casing having therein a longitudinal lead passage for slidably supporting a lead, a longitudinal space connected to a first end of said lead passage, and abore coaxially aligned with and connected to a second end of said lead passage;

lead holder means, mounted for longitudinal sliding movement with said bore, for frictionally grasping the lead;

lead guide tube means, connected to said lead holder means and mounted for longitudinal sliding movement therewith in said bore and projecting forwardly from an end of said casing, for forming a writing tip with the leading end of the lead;

means, mounted for longitudinal movement within said longitudinal space, operable by its own weight for abutting and feeding the lead through said lead passage, said abutting and feeding means including a portion having a tapered frustoconical outer surface and a longitudinal rod connected to said portion and extending into said lead passage and abutting the rear end of the lead;

locking means, movably positioned adjacent said tapered frusto-conical outer surface within said longitudinal space, for locking said abutting and feeding means, and thus the lead, in a fixed longitudinal position of said casing upon the application to the lead of an upward thrust due to writing pressure during a writing operation;

said lead guide tube means being operable, during a writing operation when the leading end of the lead is worn down, to move said lead holder means inwardly of said bore while maintaining frictional contact with the lead; and

said locking means being operable, upon the removal of said upward thrust and the lifting of the lead and said lead guide tube means from a writing surface, to unlock said abutting and feeding means from said fixed longitudinal position of said casing, such that said abutting and feeding means moves downwardly by its own weight, thus causing said longitudinal rod to abut the rear end of the lead and move the lead downwardly within said lead passage, and thus causing the lead to move said lead holder means and said lead guide tube means downwardly within said

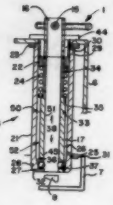
bore until said lead holder means abuts a forward portion of said casing.

4,411,544

POST BINDER BALL LOCK ASSEMBLY

Joseph L. Gallman, St. Louis, Mo., assignor to Loose Leaf Metals Company, Inc., St. Louis, Mo.

Filed Jul. 31, 1981, Ser. No. 288,770
Int. Cl.³ B42F *13/26*; E05C *19/04*
U.S. Cl. 402—69 **10 Claims**



1. A kit for a ball lock assembly for use in conjunction with loose leaf metals, comprising:

a pull ring;

an end cap having an axial opening in it; and

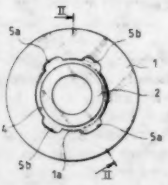
a locking device formed as an assembly and including a lock extension having an axial opening therethrough, said lock extension having a first end adapted to be at least partially closed by said end cap and a second end sized to permit reception of a loose leaf metal post of a binding system, a one-piece ball container having first and second ends, a plurality of ball lock means mounted in one of said first and second ends, means for mounting said pull ring on the other of said first and second ends of said ball container, said ball container having an external surface defining a first large diameter portion and a second small diameter portion along said surface to delimit a first shoulder therebetween, retainer means mounted in said lock extension between said lock extension and said ball container, and a spring compressed between said retainer means and said first shoulder of said ball retainer.

4,411,545

SWIVEL JOINT

Gerard Roberge, Valence, France, assignor to SKF Compagnie d'Applications Mecaniques - ADR, Saint Vallier sur Rhone, France

Filed Mar. 2, 1982, Ser. No. 353,897
Claims priority, application France, Mar. 6, 1981, 81 04797
Int. Cl.³ B65D *59/00*; F16G *11/00*; F16L *35/00*
U.S. Cl. 403—12 **3 Claims**



1. In a swivel joint comprising an outer ring having a cavity in the form of a portion of sphere, and an inner ring whose shape is partly spherical and which is housed in the spherical cavity of the outer ring, the cavity of the outer ring presenting, in part of its thickness, diametrically opposite notches,

the inner ring presents only two diametrically opposite notches, disposed substantially in the median plane perpendicular to the axis of the ring, and

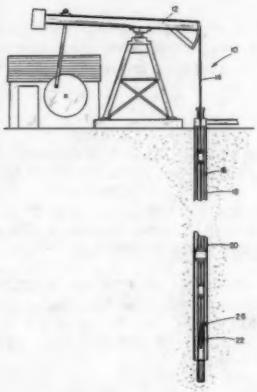
the outer ring presents only two pairs of notches whose width is substantially equal, to the width of the parts of the ring which flank the notches of the inner ring, the two notches of the same pair of outer ring notches being spaced apart from each other by a distance substantially equal, to the width of the notches of the inner ring, the assembly of two notches of a pair of outer ring notches extending over a width substantially equal to the thickness of the inner ring.

4,411,546

OIL WELL SUCKER ROD SHEAR TOOL

Carlin P. Fischer, Omaha, Nebr., assignor to Technicraft, Inc., Omaha, Nebr.

Filed Sep. 20, 1982, Ser. No. 420,329
Int. Cl.³ F16B *11/00*; F16D *1/00, 3/64*; F16L *11/12*
U.S. Cl. 403—23 **7 Claims**



1. An oil well pump sucker rod shear tool comprising,

an elongated generally cylindrical member having first and second ends, one of said ends being threaded for connection to a threaded member operatively connected to the well pump, the other of said ends being externally threaded for connection to a sucker rod,

said elongated member having a reduced diameter portion formed therein between its ends forming a shear portion which will shear upon predetermined stress,

and a sleeve sealably mounted on said elongated member which protects said shear portion from the corrosive effects of the fluid being pumped.

4,411,547

BRACED STRUCTURAL MEMBER

Alfred E. Johnson, P.O. Box 1207, Cardston, Alberta, Canada T0K 0K0

Filed Sep. 23, 1980, Ser. No. 189,578
Claims priority, application Canada, Jul. 18, 1980, 356546
Int. Cl.³ F16B *1/00*
U.S. Cl. 403—205 **3 Claims**

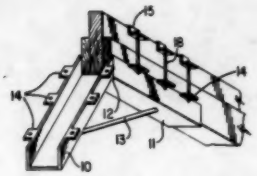
1. A connector for rigidly joining two adjacent structural elements in a truss, with each structural element being constituted by an assembly of face to face wooden elements providing a beam comprising:

a pair of channel members joined together at an angle so that one of said beams can be positioned with the side edges of said wooden elements confined within the channel of each channel member, the channel of said channel members

forming three sides of a rectangle to receive said side edges and having outwardly extending elements with bolt-receiving holes;

brace means connected to the channel members for maintaining said angle;

clamping means of channel shape in which the channel forms three sides of a rectangle for clamping the ends of said two adjacent structural elements securely into the channels of said channel members with the other side edge of at least one of said wooden elements confined within the channel of said clamping means, said clamping means



having outwardly extending elements with bolt-receiving holes; and

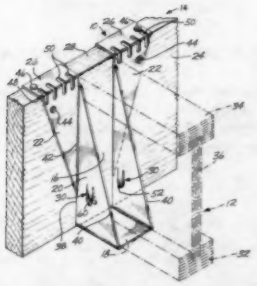
bolt means for compressing said clamping means toward said channel members, said clamping means comprising axially spaced apart clamping strips, each strip located opposite a pair of holes in the outwardly extending elements of said channel members to receive said bolts in aligned holes in said strips and said channel members, whereby tightening of the bolts compresses the strips against a structural element to clamp the side edges of said wooden elements in the channels of said channel members and oppositely disposed clamping strips.

4,411,548

JOIST HANGER

J. Donald Tschan, Bellevue, Wash., assignor to P. H. Bowman Co., Inc., Seattle, Wash.

Filed Jun. 8, 1981, Ser. No. 271,361
Int. Cl.³ B25G 3/00; F16B 7/08, 9/00; F16L 41/00
U.S. Cl. 403—232.1 **5 Claims**



1. A joist hanger for supporting the end portion of an I-beam shaped joist having a lower chord of a given depth, such joist hanger including:

(a) a laterally disposed seat base;

(b) a pair of seat sidewalls extending upwardly from opposite lateral sides of the seat base that cooperates with the seat base and defines a U-shaped seat portion that receives the end portion of said I-beam shaped joist therein;

(c) header overlapping flanges extending laterally from said seat sidewalls; and

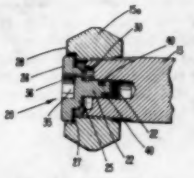
(d) at least one elongate retaining prong extending perpendicular to said base and nominlly laterally inward from each sidewall and into the U-shaped seat portion, said prong terminating at a tip portion spaced from the seat base a distance corresponding to the depth of the lower chord of the I-beam shaped joist, each of said prongs being resiliently interconnected to a corresponding seat sidewall that deflects laterally outward from nominal position into retracted position substantially out of the envelope of said U-shaped seat which allows downward passage of the lower chord of the I-beam shaped joist and then snaps back into its nominal, inward position once the I-beam shaped joist is seated on the seat base so that if the I-beam shaped joist tends to lift upwardly, the tip of the prong bears downwardly against an upper surface of the lower chord of the joist and prevents such upward movement.

4,411,549

INSTALLATION AND RETAINER DEVICE FOR POWER STEERING PITMAN ARM

Peter H. Sheppard, R. H. Sheppard Co., Inc., Hanover, Pa. 17331

Filed Dec. 22, 1980, Ser. No. 219,389
Int. Cl.³ B25G 3/00; F16B 9/00
U.S. Cl. 403—258 **12 Claims**



1. In combination with a working shaft having a threaded bore in the one end, an installation and retainer cap assembly mounting and locking an annular collar member on the working shaft comprising:

a body on the said retainer cap;

a threaded shaft extending from the inner side of the body, said shaft being threadably received by said bore and axially advancing the retainer cap into the bore, said body being enlarged relative to said shaft;

said annular collar member and said shaft having internal and external splines, respectively, the cooperating splines of said member and said working shaft being tapered involute splines which lock together, said cap providing full working and locking engagement between said splines;

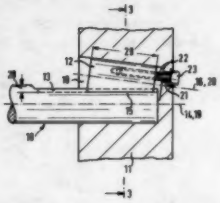
a recess in the end of the threaded bore substantially matching said body in size and receiving and accommodating at least a portion of said body and stabilizing the retainer cap during the axial advance into the bore; and

an outer cap flange on the opposite axial side of said body from said threaded shaft and extending around the periphery of said body, the inside face of said cap flange selectively engaging the outside face of the annular collar member, the outside face of the cap being substantially flush with said outside face of the annular collar member during the engagement between the inside flange face and the outside collar face, whereby the clearance along the outside face of the annular member is not substantially adversely affected by the presence of said retainer cap.

4,411,550
TORQUE TRANSMITTING COUPLING

Peter Schutt, Lochgau; Martin Bernhardt, Bietigheim; Klaus Nitsche, Erligheim; Horst Grindler, Freudental, and Hans-Joachim Hofmann, Remshalden, all of Fed. Rep. of Germany, assignors to Durr-Dental GmbH & Co., KG, Bietigheim, Fed. Rep. of Germany

Filed Aug. 28, 1981, Ser. No. 297,367
Claims priority, application Fed. Rep. of Germany, Aug. 29, 1980, 3032537
Int. Cl.³ B25G *3/28*; F16B *3/00, 7/00*; F16D *1/00*
U.S. Cl. 403—358 7 Claims

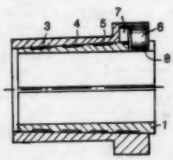


1. A torque transmitting coupling comprising a female member having a central first cylindrical bore to receive a shaft and a second cylindrical bore which receives a fastening bolt, said second cylindrical bore intersecting said first cylindrical bore at an acute angle, a cylindrical shaft received snugly in said first cylindrical bore, and having a secant face parallel to the axis of the shaft, a cylindrical fastening bolt received snugly in said second cylindrical bore and having a secant face parallel to and engaging said secant face of said shaft, and means moving said cylindrical fastening bolt axially in said second cylindrical bore and thereby wedging said secant face of said bolt tightly against said secant face of said shaft.

4,411,551
DEVICE FOR PROVIDING A FRICTION JOINT

Kurt Adelbratt, Gothenburg, Sweden, assignor to Aktiebolaget SKF, Sweden

Filed Mar. 12, 1981, Ser. No. 242,830
Claims priority, application Sweden, Mar. 19, 1980, 8002136
Int. Cl.³ F16D *1/06*
U.S. Cl. 403—370 7 Claims

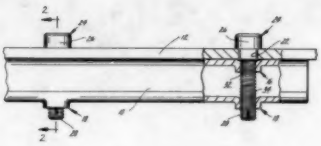


1. A coupling device for providing a friction joint comprising inner and outer elements, said inner element having a tapered outer surface for engagement with a complementary tapered inner surface formed in a bore in the outer element, means for axially displacing said elements in relation to each other parallel to the cone axes of the tapered surfaces for radially deforming at least one element, the tapered surface of one of said elements being continuous and the complementary tapered surface of the other element having at least one circumferential groove formed therein thereby providing only contact between the tapered surfaces at other than the groove location and thereby reducing the active contact surface area between said tapered surfaces, the tapered surface of one of said elements only being provided with a deformable friction reducing material which transfers to the initially uncovered tapered surface of the other element during axial displacement of said elements.

4,411,552
JOINT FOR SECURING A TUBULAR MEMBER TO A SUPPORT MEMBER

Joseph S. Lanham, Lexington, and Neal R. Bruckner, Georgetown, both of Ky., assignors to Hoover Universal, Inc., Ann Arbor, Mich.

Filed May 29, 1981, Ser. No. 268,272
Int. Cl.³ F16B *25/00*
U.S. Cl. 403—388 10 Claims

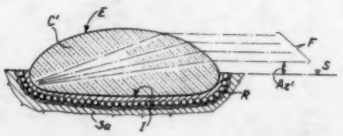


1. A joint for securing a tubular member to a support member comprising a pair of aligned extruded holes in the sidewall of the tubular member opposite each other, a hole in the support member, the support member being disposed against the outside surface of the portion of the sidewall of the tubular member containing one of said pair of extruded holes and with the pair of extruded holes of the tubular member being aligned with the hole in the support member, and fastening means fastening the two members together comprising means engaging the support member and passing through the hole in the support member including a shank having a self-tapping thread which threadedly engages complementary threads in both extruded holes in the tubular member, said self-tapping thread having cut the complementary threads in both extruded holes during the fastening operation, the portion of the tubular member's sidewall containing the other of said extruded holes being slightly displaced toward the portion containing said one extruded hole during the fastening operation to create differential thread action of the two threaded extruded holes on the shank of said fastening means and improve the holding quality of the joint.

4,411,553
RETRO-REFLECTING GLOBULES FOR ROAD SURFACE MARKING

Ludwig Eigenmann, POB 8, CH 6833 Vacallo, Switzerland

Continuation of Ser. No. 54,235, Jul. 2, 1979, abandoned. This application May 19, 1981, Ser. No. 265,231
Claims priority, application Italy, Jul. 5, 1978, 25381 A/78
Int. Cl.³ E01F *9/04*
U.S. Cl. 404—16 3 Claims



1. A retro-reflecting assembly for traffic regulating surface markings on roadway pavements, comprising a transparent globule having a body of essentially convexly curved irregular shape, said body including an upper portion to be exposed to light impingement and a bottom portion having a bottom surface; and a monolayer of reflecting transparent microspheres for retro-reflecting light beams, said monolayer being

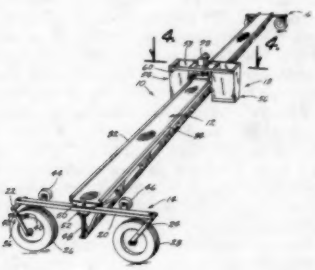
connected to said bottom surface of said bottom portion, said bottom portion being relatively shallower than said upper portion, said upper portion merging into said bottom portion so that a cross-section in a horizontal plane extending between said upper portion and said bottom portion has a configuration with two mutually perpendicular axes which go through a bearing center of said cross-section and of which one axis is of a greater length than the length of the other of said axes, whereby an optimal light response of said body to light beams impinging on said body under different vertical and horizontal angles is obtained.

4,411,554

MATERIAL SPREADER AND BRIDGE

Edward P. Gratzfeld, Rte. 1, Box 259, Yankton, S. Dak. 57078

Filed Oct. 21, 1981, Ser. No. 313,455
Int. Cl.³ E01C *19/18*
U.S. Cl. 404—110 **8 Claims**



1. A material spreader for spreading material onto a surface comprising,

first and second spaced-apart wheeled frames,

an elongated horizontally disposed bridge means secured to and extending between said wheeled frames,

said bridge means including a flat horizontally disposed worker support surface thereon,

a hopper assembly movably mounted on said bridge means, said hopper assembly being removably mounted on said bridge means to permit said worker support surface to be utilized,

said hopper assembly comprising a pair of hoppers positioned on opposite sides of said bridge means,

each of said hoppers having upper and lower ends, the upper end of each of said hoppers adapted to receive the material to be spread, means at the lower end of each of said hoppers adapted to control the flow of material therefrom,

and means for moving said hopper assembly between the ends of said bridge means,

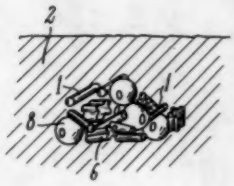
each of said hoppers having elongated discharge openings formed at the lower end thereof, the longitudinal axis of each of said discharge openings being disposed transversely to the length of said bridge means, the distance between the discharge openings in said hoppers being equal to the length of one of said discharge openings.

4,411,555

DRAINING, IRRIGATING AND DISPERSING MASS

Monique L. S. Minvielle, 11, rue Solferino, 75007 Paris; Albert H. F. Mazoin, 24570 Condat sur Vezere, Dordogne; Robert P. Brun, Avenue de la Croix du Sud, 33120 Arcachon; Sylvain V. L. Chevanne, 95450 Themericourt, Val d'Oise, and Jacques L. A. See, 92200 Neuilly-sur-Seine, Hauts de Seine, all of France

Filed Jun. 17, 1980, Ser. No. 169,711
Claims priority, application France, Jul. 17, 1979, 79 18429; Dec. 11, 1979, 79 30298; Jul. 3, 1980, 80 14849
Int. Cl.³ E02B *11/00*
U.S. Cl. 405—50 **3 Claims**



1. A mass for draining, irrigating or lightening of various soils, said mass being composed of hollow elements of various sizes, shapes, wall thicknesses and rigidity, said hollow elements internally defining through open-ended capillary or semi-capillary passages, said mass further being composed of soil in which said hollow elements are dispersed in mutual contact and so oriented relative to one another as to provide between adjacent hollow elements spaces of various shapes and dimensions which combine with the capillary or semi-capillary passages of the hollow elements to form a porous mass for drainage, irrigation or lightening of the soil, the hollow elements including elements that comprise two hollow hemispheres and means for joining said hollow hemispheres to form hollow spheres.

4,411,556

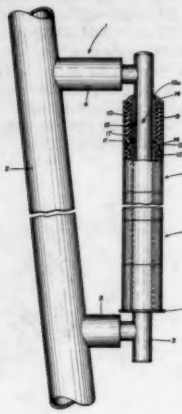
BARGE BUMPER CONSTRUCTION

Raymond F. Leblanc, North Canton, and William T. Cummins, Mogadore, both of Ohio, assignors to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Apr. 29, 1981, Ser. No. 258,567
Int. Cl.³ E02B *3/22*
U.S. Cl. 405—213 **6 Claims**

1. An elastomeric sleeve member for loose telescopic assembly on a fixed vertical metal bumper pipe member of a bumper device for an offshore oil ring structure; comprising a cylindrical sleeve body having upper and lower ends; the body being formed of a plurality of elastomeric materials having different physical properties integrally cross-link bonded together; said plurality of elastomeric materials including an outer annular layer of #60 to #70 Shore A Durometer rubber providing an abrasion resistant annular sleeve outer contact surface, and a load supporting inner layer of cracked friction providing a relatively low friction interior annular sleeve surface rotatable on said fixed vertical metal bumper pipe member; the cylindrical body having a length in excess of two times its inner diameter, having an inner diameter in excess of 18 inches, and having a length of approximately 4 feet; and the upper and lower

annular ends of the cylindrical sleeve body having complementary zigzag shapes in cross section including an annular conical surface extending between axially spaced flat ring annular surfaces located in planes normal to the axis of the sleeve body.



4,411,557

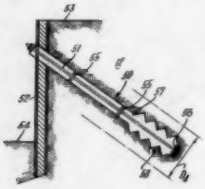
METHOD OF MAKING A HIGH-CAPACITY EARTHBOUND STRUCTURAL REFERENCE

Weldon S. Booth, 750 Rte. 9W, Piermont, N.Y. 10968

Continuation of Ser. No. 959,903, Nov. 13, 1978, abandoned, which is a continuation of Ser. No. 783,316, Mar. 31, 1977, abandoned. This application Nov. 20, 1980, Ser. No. 208,773

Int. Cl.³ E02D *5/44*

U.S. Cl. 405—238 **10 Claims**



1. The method of constructing a high-capacity tension-sustaining earch-anchor reference having an axis of tension-sustaining alignment which is at angular offset from the vertical, which comprises excavating earth material to form an elongate generally cylindrical bore of a first diameter on said axis, then locally expanding the excavation to characterize a selected axial extent of the bore by local cutting to larger diametral extent at longitudinally spaced regions of the bore, each of the expanded excavations being characterized by a wall surface of relatively uniform slope with respect to the longitudinal axis of the bore and extending from said first to a second diameter, whereby the characterized bore is defined in a relatively undisturbed body of earth material, selecting a tension rod of length to span more than the characterized axial extent of the bore, said rod having one or more radially projecting formations for enhanced engagement to cementatious material, placing the rod within the bore in radially spaced relation with the bore wall and in coaxial relation with the characterized axial extent of the bore, and then casting a cementatious filling in the bore by smoothly introducing the filling into the bore, the filling being to an extent filling at least the characterized axial extent of the bore with the rod embedded to an extent short of the outer end of the rod, whereby upon curing, the cast filling is installed in a relatively undisturbed body of earth material, with an end of the rod externally exposed, thereby permitting maximum availability of the confined compressive strength of the earth material to enhance the tension-sustaining capacity of the earth-anchor.

4,411,558

ROOF SUPPORT SUITABLE FOR USE IN MINES

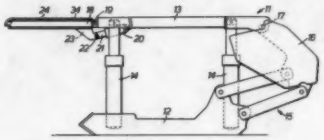
Dennis F. Rutherford, Cheltenham, England, assignor to Dowty Mining Equipment Limited, England

Filed Nov. 4, 1981, Ser. No. 318,218

Claims priority, application United Kingdom, Nov. 26, 1980, 8037937

Int. Cl.³ E21D *15/44, 17/05*

U.S. Cl. 405—294 **9 Claims**



1. A roof support suitable for use in mines including a roof-engageable member and a cantilever member, one of these two members comprising a base, a cover member providing a roof-engageable surface, and a plurality of longitudinal members secured, in parallel manner, both to said base and said cover member, whereby said base, cover member and longitudinal members together form a plurality of parallel elongate compartments extending in the lengthwise direction of the cover member, and the other of said two members including a plurality of parallel and rigid elongate elements slidably fitting into said compartments and joined together at least at their end portions remote from said one member, said other member also including a plate, having a roof-engageable surface, which defines the profile in plan of that member and which is so secured to said elements, in parallel relation therewith, as to be relatively slidable upon and with respect to said roof-engageable surface of said cover member, the transverse widths of said surfaces being such that when said roof-engageable member and said cantilever member are caused by actuator means relatively to slide from a retracted condition to an extended condition, or to a partially-extended condition, one of said roof-engageable surfaces effectively forms a full width extension of the other of said roof-engageable surfaces.

4,411,559

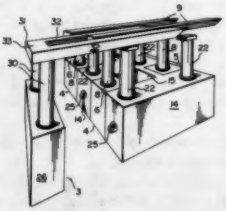
MINING SYSTEM

Aunald Jopling, Coleman, Alberta, Canada

Filed Jun. 18, 1981, Ser. No. 275,019

Int. Cl.³ E21D *23/00*

U.S. Cl. 405—300 **3 Claims**



1. A mine roof support comprising first cradle means including a first pair of spaced apart chocks for slidable mounting on

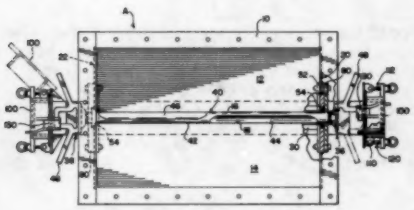
a seam floor, a crossbar interconnecting said first pair of chocks and first prop means extending upwardly from said first cradle means and including roof supporting bars for supporting a section of mine roof; second cradle means including a second pair of spaced apart chocks for slidable mounting on a seam floor, a web interconnecting said second pair of chocks, and second prop means extending upwardly from said second cradle means for supporting a section of mine roof; first coupling means interconnecting said first and second cradle means for moving said first and second cradle means relative to each other and toward or away from a longwall mining face; said first chocks and said web being so shaped that said first and second cradle means are slidably interconnected in overlapping relationship with said first and second pairs of chocks parallel to each other; third cradle means including third chock means for slidable mounting on a seam floor, and third vertically movable props extending upwardly from said third chock means; said third props including roof supporting arms so spaced apart that they are parallel to and between said bars for supporting a section of mine roof; second coupling means for releasably interconnecting said second and third cradle means for moving said third cradle means relative to said first and second cradle means and for providing a working passage beneath said third prop means and between said first and second chock means and said third chock means.

4,411,560

PNEUMATIC HOPPER DISCHARGE OUTLET

Ronald J. McComb, Youngstown, Ohio, assignor to The Youngstown Steel Door Company, Cleveland, Ohio

Filed Mar. 13, 1981, Ser. No. 243,390
Int. Cl.³ B65G *53/40*
U.S. Cl. 406—128 **13 Claims**



1. A pneumatic hopper discharge outlet comprising:
a valve shaft having a longitudinal axis and mounted for rotational movement about said longitudinal axis;
at least one sloping hopper side wall having a lower edge extending longitudinally of, and adjacent to said valve shaft; and,
adjustable mounting means is mounted for rotation about a mounting means axis for adjustably mounting the valve shaft, said adjustable mounting means having a bore disposed eccentric to the mounting means axis for receiving the valve shaft and being movably mounted for selectively adjusting the position of the valve shaft transversely of the longitudinal axis.

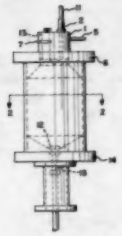
4,411,561

SPRING FEEDING DEVICE

John T. Carnahan, Fairborn, Ohio, assignor to Emerson Electric Company, St. Louis, Mo.

Filed May 22, 1981, Ser. No. 266,566
Int. Cl.³ B65G *51/02*
U.S. Cl. 406—137 **6 Claims**

1. A device for supplying helical wire compression springs in sequence to an output conduit, comprising:
casing means defining a spring supply chamber therein for receiving a plurality of helical wire compression springs of a first diameter,
a delivery tube mounted on top of said casing, defining a spring outlet opening of a diameter slightly larger than said first diameter, said delivery tube communicating through said spring outlet opening between said chamber and said output conduit,



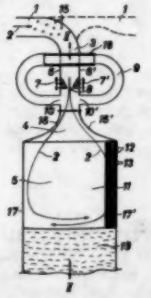
agitator means, including an air inlet communicating with the bottom of said chamber, for supplying air under pressure to said chamber such that springs in said chamber are agitated and pass out of said chamber through said delivery tube and into said output conduit, and
shedder piston means surrounding said spring outlet opening of said delivery tube and movable with respect thereto so as to dislodge springs entangled within or blocking said spring outlet opening.

4,411,562

APPARATUS AND METHOD FOR SEPARATING OPENED END FLOCKS FROM A TRANSPORTING AIR STREAM

Werner Lattmann, and Robert Moser, both of Winterthur, Switzerland, assignors to Riter Machine Works, Ltd., Winterthur, Switzerland

Continuation of Ser. No. 701,800, Jul. 1, 1976, abandoned. This application Jan. 30, 1979, Ser. No. 8,699
Claims priority, application Switzerland, Jul. 16, 1975, 9296/75
Int. Cl.³ B65G *53/40*
U.S. Cl. 406—157 **21 Claims**



1. An apparatus for separating opened fiber flocks from a transporting air stream comprising
a transporting duct for a flock-laden transporting air stream;
a chute head for receiving at least a part flow of the flock-laden air stream;
a connecting duct communicating said transporting duct with said chute head for delivering said flow from said transporting duct to said chute head;
a restriction within said connecting duct in the flow path of

said flow, said restriction abruptly enlarging to a larger cross-sectional area in said connecting duct downstream of said restriction; and

a closed ring duct connected to two opposite sides of said connecting duct downstream from said restriction to maintain said sides in continuous open communication with each other therethrough for directing air impulses into said connecting duct to move said flow to and fro in rapid sequence across said chute head.

4,411,563

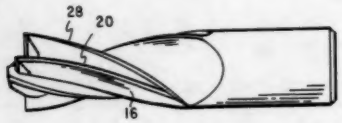
CUTTER DEVICE

Elwood Moon, Cemetery Dr., Watsontown, Pa.

Filed Jul. 31, 1981, Ser. No. 288,904

Int. Cl.³ B23B *51/02*

U.S. Cl. 407—54 **5 Claims**



1. A cutter device for use in end milling or profile cutting or combined end milling and profile cutting operations, said device comprising:

an elongated tool body having an elongated flute section having an exposed end;

a first plurality of cutting flutes which are spiral shaped and which are integral with and extend outwardly from the surface of the section, the flutes in the first plurality being equidistantly spaced apart to define a first uniform outer diameter, the first plurality of flutes extending along said surface from a point intermediate the ends of the body to a first end position on said exposed end, said first plurality of flutes in said first end position defining a first set of cutting blades lying in a first plane of cut for end milling; and

a second plurality of cutting flutes which are spiral shaped and which are integral with and extend outwardly from said surface beyond the first plurality of flutes, the flutes in said second plurality being equidistantly spaced apart to define a second uniform outer diameter which is larger than said first diameter, the flutes in all of said pluralities being interleaved, the second plurality of flutes being usable for profile cutting and extending along said surface from said intermediate point to a second end position on said exposed end, said second plurality of flutes in said second end position defining a second set of cutting blades lying in a second plane of cut for end milling, said first plane of cut lying below said second plane of cut when the body is disposed vertically with the exposed end pointing downward.

4,411,564

INDEXABLE CUTTING INSERT HAVING RADIUSED CUTTING EDGES

William B. Johnson, Rockford, Ill., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.

Filed Oct. 19, 1981, Ser. No. 312,772

Int. Cl.³ B23B *39/00, 47/00*; B23P *15/34*; B23D *1/12*

U.S. Cl. 407—113 **6 Claims**

1. An indexable cutting insert comprising a block of cutting material having first and second oppositely facing and generally quadrilateral face surfaces, said block further including first and second oppositely facing edge surfaces extending between two opposite side margins of said face surfaces, said block having third and fourth oppositely facing and substantially flat and planar edge surfaces extending between the remaining two side margins of said face surfaces, there being a first cutting edge defined along the intersection of said first edge surface with said first face surface and with said third edge surface and there being a second cutting edge defined along the intersection of said second edge surface with said first face surface and with said fourth edge surface, the junction between said first face surface and said third edge surface being defined by a convexly curved surface which decreases in area per unit of length as said curved surface progresses from

said first edge surface toward said second edge surface, and the junction between said first face surface and said fourth edge surface being defined by a convexly curved surface which decreases in area per unit of length as the latter curved surface progresses from said second edge surface toward said first edge surface, whereby each of said cutting edges is formed with a convexly curved portion of relatively large radius while each of said third and fourth edge surfaces defines a substantially flat and planar locating face disposed adjacent said second face surface.

4,411,565

FINISHING INSERT WITH IMPROVED CHIP CONTROL

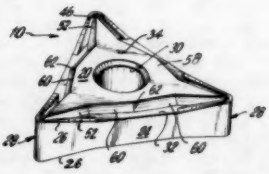
Jayanta Hazra, and Sazzadul Haque, both of Troy, Mich., assignors to General Electric Company, Detroit, Mich.

Filed May 8, 1981, Ser. No. 261,694

The portion of the term of this patent subsequent to Nov. 16, 1999, has been disclaimed.

Int. Cl.³ B26D *1/00*

U.S. Cl. 407—114 **6 Claims**



1. A finishing insert for use with an indexable cutting tool comprising:

a flat wafer of cutting material of generally polygonal plan form, having a pair of opposed faces and a plurality of upstanding side walls extending therebetween with the juncture between each said side wall and a face defining a peripheral cutting edge, wherein each peripheral cutting edge adjacent said one face is generally trough-shaped in configuration, with the distal ends of said trough configuration being defined by said sloping corner portions and with the central portion of said trough configuration being defined by a generally planar undercut area, said planar undercut area being disposed substantially parallel to said opposed insert face, said polygonal wafer further including a plurality of radiused corner portions with at least one

of said insert faces being non-planar with the corner portions thereof sloping inwardly towards the opposed insert face, each of said corner portions of said nonplanar face including a pair of abutting, generally triangular chip groove portions and a central triangular land area disposed between each pair of abutting chip groove portions, each chip groove portion being spaced from the adjacent cutting edge of the insert so as to define a side land area, said central triangular land area being generally planar and disposed parallel to said opposed insert face, each said central triangular land area including a pair of side edges and a vertex, with an imaginary line bisecting said vertex being disposed substantially normal to the radiused corner portion associated therewith, and with said side edges of each said triangular land area being disposed at an angle relative to the adjacent cutting edges of the insert such that the width of each said chip groove portion increases from its end adjacent its respective corner portion to its opposed end, and with the depth of each chip groove portion increasing from its end adjacent its respective corner portion to its opposed end whereby said insert may be utilized to machine finishing cuts through a range of feed rates while simultaneously reducing cutting forces.

4,411,566

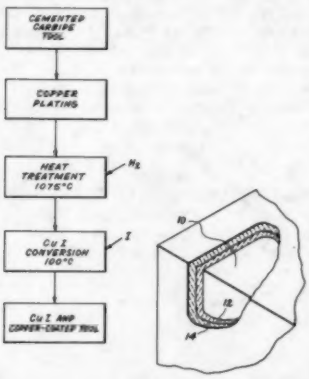
SELF-LUBRICATING CUTTING TOOL AND METHOD

Minyoung Lee; William R. Reed, Jr., both of Schenectady, and Lawrence E. Szala, Scotia, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Jan. 5, 1981, Ser. No. 222,786

Int. Cl.³ B26D *1/00*

U.S. Cl. 407—119 **8 Claims**



1. A self-lubricating cutting tool comprising

(a) a tool body,

(b) a layer of copper metal bonded to surface area of said body at which cutting action occurs in use, and

(c) a film of copper iodide formed integral with the outer surface of said copper layer.

4. A method making a self-lubricating metal cutting tool which comprises the steps of forming a tool body, applying an adherent copper coating to the body, and forming a film on the copper coating of a copper iodide.

4,411,567

TUBULAR KEY CUTTING MACHINE

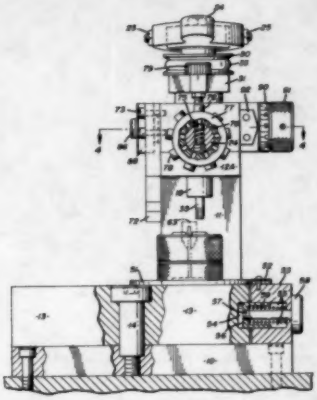
Frank P. Agius, 909 Washington Ave., Alpena, Mich. 49707

Filed Sep. 14, 1981, Ser. No. 301,580

Int. Cl.³ B23C *1/16*

U.S. Cl. 409—82 **11 Claims**

1. A tubular key cutting machine comprising in combination a horizontal turntable, a rotatable chuck positioned off center in said turntable, means in said rotatable chuck for mounting a tubular key blank in any of a plurality of vertically spaced locations, key cutter means arranged for dual movement along a path parallel with the axis of said tubular key blank in said rotatable chuck and transversely of said path for selective engagement with said tubular key blank when said turntable is in a first position, first adjustment means for locating said



cutter means in any of a plurality of transversely disposed locations relative to said path, second adjustment means for locating said cutter means in any of a plurality of vertically spaced locations along said path, means for temporarily positioning said turntable and the rotatable chuck and key blank therein in said first position alongside said path means for rotating said cutter and means for moving said cutter vertically on said path.

4,411,568

COLLET-TYPE CHUCK

Günter H. Röhm, Heinrich-Röhm-Strasse 50, 7927 Sontheim, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,466

Claims priority, application Fed. Rep. of Germany, May 24, 1980, 8014064[U]

Int. Cl.³ B23C *5/26*; B23B *31/10*

U.S. Cl. 409—233 **10 Claims**

1. A chuck comprising:

means including a chuck body adapted to be rotated about an axis and formed centered on said axis with a forwardly open tool-receiving seat;

means including a holding element mounted in said body for axial displacement therein between a rear holding position securing a tool in said seat and a front releasing position permitting a tool to be inserted backward into and withdrawn forward from said seat;

at least one holding spring braced between said holding element and said body and urging said holding element axially backward into said holding position;

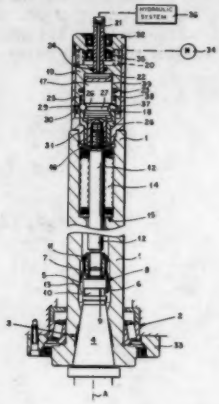
a piston axially coupled to said holding element and having an axially backwardly directed piston face;

means for exerting hydraulic pressure axially forward against said face and thereby urging said holding element axially forward into said releasing position;

at least one locking organ displacable in said holding position of said holding element between a locking position retaining said holding element in said holding position against axial displaceament in said body and a freeing position out of locking engagement with said holding element and permitting axial displacement of said holding element in said body;

means including an actuating member engageable with said

locking organ for displacing same into said freeing position on pressurization at said piston face; and



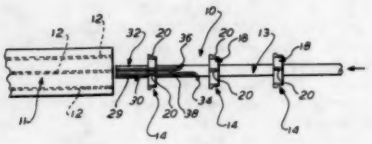
at least one locking spring engaging said actuating member and urging said locking organ into said locking position.

4,411,569

APPARATUS FOR BROACHING RIFLING

Robert M. Pizzola, Stroudsburg, Pa., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 22, 1981, Ser. No. 276,410
Int. Cl.³ B23D *37/16*
U.S. Cl. 409—261 **6 Claims**



1. A tool for use with a linear prime mover for broaching a gain twist rifling groove in a gun barrel comprising:

a support and drive shaft attachable to said prime mover;

a plurality of cutter assemblies mounted in spaced apart fixed position along said support and drive shaft, and adapted to rotate freely thereabout which includes;

a hub mounted in fixed position on said support and drive shaft;

a shell rotatably mounted on said support and drive shaft axially adjacent said hub;

bearing means located between said shell and said support and drive shaft; wherein said cutters are mounted on said shell and project radially therefrom;

a plurality of cutters projecting radially from each of said cutter assemblies, and adapted for cutting engagement with the rifling groove inscribed in said gun barrel; and

indexing means for aligning said cutters with said rifling groove which includes;

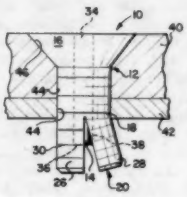
parallel disposed guide bars positioned adjacent said gun barrel, said guide bars defining a slot to receive one of said cutters, and to permit the cutter to slide therethrough into aligned contact with said rifling groove when said tool is brought into position therewith.

4,411,570

TAMPER-PROOF FASTENER

Ilija Juric, c/o William Bayley Company, 1200 Warder St., Springfield, Ohio 45503

Filed Apr. 6, 1981, Ser. No. 251,607
Int. Cl.³ F16B *13/04*
U.S. Cl. 411—271 **8 Claims**



1. A tamper-proof fastener comprising:

a body having a head portion and a shank portion, said shank portion having at least one slit extending along a radius and located in an end of said shank opposite said head portion, said slit forming at least two legs in said end;

said body defining a central bore extending from said head portion and terminating proximate said end such that it intersects said slit at said legs;

said central bore terminating in a squared-off shoulder proximate said end in at least one of said legs;

said central bore terminating in a tapered shoulder proximate said end in at least one other of said legs;

a headless pin sized to fit within said bore such that insertion of said pin into said bore causes an end of said pin to abut said squared-off shoulder and to engage said tapered shoulder thereby deflecting outwardly said other leg adjacent said end of said shank; and

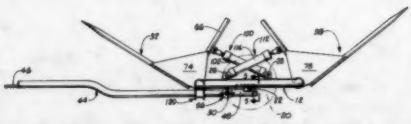
said squared-off shoulder being sized to prevent displacement of said pin therepast when said other leg is deflected outwardly.

4,411,571

HAY BALE RETRIEVING AND TRANSPORTING TRAILER

Troy Gildon, Rte. 3, Box 59, Duncan, Okla. 73533

Filed Apr. 13, 1981, Ser. No. 252,792
Int. Cl.³ A01D *87/12*
U.S. Cl. 414—24.5 **9 Claims**



1. A hay bale retrieving and transporting trailer comprising:

a framework;

ground-engaging wheels connected to the framework;

an elongated towing tongue extending outwardly from one side of said framework and pivotally connected to said framework for pivotation about a vertical axis;

a forward bale pickup and supporting cradle subassembly pivotally mounted on said one side of the framework for pivotation about a horizontal axis between a bale pickup position and a bale transporting position, said forward bale pickup and supporting subassembly including;

a pair of bale pickup tines for piercingly engaging a bale spaced from each other and extending substantially horizontally in the bale pickup position of said forward bale pickup and supporting cradle subassembly, one of said tines in said pair of bale pickup tines defining an

angulation adjacent the horizontal pivotal axis of said forward bale pickup and supporting cradle assembly for accommodating passage under said one tine in said pair of tines of said towing tongue during the pivotal movement of said towing tongue and when said forward bale pickup and supporting cradle subassembly is pivoted to said bale transporting position; and

a vertically extending member connected at substantially a right angle to at least one of said bale pickup tines to cradle a hay bale with said one bale pickup tine;

a rear bale pickup and supporting cradle subassembly pivotally mounted on said framework on the opposite side of said framework from said forward bale pickup and supporting cradle subassembly for pivotation about a horizontal axis between a bale pickup position and a bale transporting position, said rear bale pickup and cradle subassembly including: p2 at least one additional bale pickup tine for piercingly engaging a bale extending substantially horizontally in the bale pickup position of said rear bale pickup and mounting cradle subassembly; and

whereby the bales are supported on said tines of said pickup and support cradle subassemblies during transport; and

a vertically extending member connected at substantially a right angle to said last-mentioned bale pickup tine to cradle a hay bale with said last-mentioned pickup tine; and

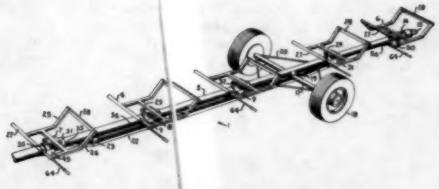
means for pivoting said towing tongue about said vertical axis.

4,411,572

BALE TRANSFER CARRIER

Dewey Hostetler, Harper, Kans., assignor to DewEze Manufacturing, Inc., Harper, Kans.

Filed Aug. 20, 1981, Ser. No. 294,776
Int. Cl.³ A01D *87/12*
U.S. Cl. 414—24.5 **3 Claims**



1. A carrier for a cylindrical bale of hay comprising:

(a) an elongate, tubular main body member having a forward end with a hitch means for connection to a drafting vehicle;

(b) an axle and wheels mounted to said main body member for movement over a ground surface;

(c) a bale supporting cradle mounted to said main body member;

(d) a collar rotatably sleeved on said main body member with said cradle affixed to said collar and swingable sidewardly thereon between transport and unloading positions;

(e) a latch means extending between said collar and said main body member and operable to lock said collar in said transport position;

(f) abutment members affixed to said main body on opposite sides of said collar and limiting any tendency toward longitudinal sliding thereof along said main body member; and

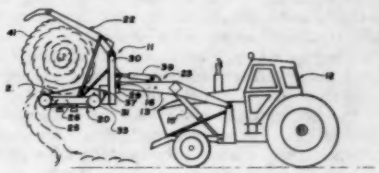
(g) said collar having a stop thereon and engageable with one of said abutment members for limiting rotation of said collar on said main body member.

4,411,573

BALE HANDLING APPARATUS

Tod N. Townsend, Box 662, White Sulphur Springs, Mont. 59645

Filed Jul. 27, 1981, Ser. No. 287,287
Int. Cl.³ A01D *87/12*
U.S. Cl. 414—24.6 **3 Claims**



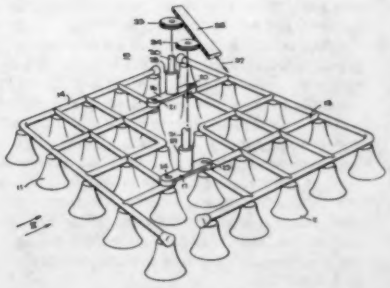
1. Bale handling apparatus including a frame portion, a bale moving portion, a bale engaging portion and a control portion; said frame portion including a base section, said base section including a pair of substantially parallel spaced side members, said frame portion also including means for pivotally connecting said apparatus to a vehicle; said bale moving portion including rotatable means extending between said side members of said base section, said rotatable means being disposed along said side members of said base section, said rotatable means including a plurality of spaced parallel roller means with a plurality of raised portions, the roller means adjacent the free ends of said side members being disposed inside the nip of said bale and the outer layer thereof; said bale engaging portion including a plurality of spaced hook means pivotally connected to said frame portion adjacent one edge thereof, said hook means being oriented substantially parallel to said side members of said base section, said hook means being of a length substantially the same as said side members; said control portion including means for driving said rotatable means, means for pivoting said hook means with respect to said base section and means for changing the position of said base section; whereby when said apparatus is attached to a vehicle, a round bale may be positioned on said apparatus by tilting said base section and grasping said bale between said hook means and said base section, and said bale may be opened and distributed by raising said base section and driving said rotatable means to unroll said bale.

4,411,574

EGG TRANSFER HEAD

Douglas E. Riley, Canton, Mich., assignor to Diamond Automations, Inc., Framington, Mich.

Filed Jul. 13, 1981, Ser. No. 282,754
Int. Cl.³ B65G *59/04*
U.S. Cl. 414—121 **10 Claims**



1. A transfer system having a transfer head for transporting

a predetermined plurality of articles which are disposed in a first array configuration having m columns by n rows at a first station, to a second station, the predetermined plurality of articles being reconfigured from the first array configuration to a second array configuration having n columns by m rows so as to be deposited at the second station in the second array configuration, the transfer head being provided with a predetermined plurality of article holders for engaging respective ones of the predetermined plurality of articles during transportation, the transfer system further comprising:

first and second article holder carrier means, each said article holder carrier means being arranged to retain one-half of the predetermined plurality of article holders in positions corresponding to the first array configuration; and

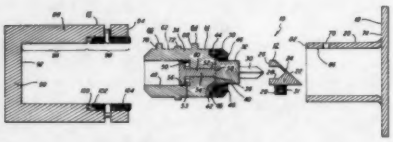
linkage means connected to each of said first and second article carrier means to permit said first and second article carrier means to be moved with respect to one another, said linkage means being rotated by approximately 90° so as to change said arrangement of the article holders from the first array configuration to the second array configuration.

4,411,575

SAMPLE TRANSFER VESSEL

Mark C. Miller, Chanhassen, Minn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed May 1, 1981, Ser. No. 259,723
Int. Cl.³ B65G *61/00*
U.S. Cl. 414—217 **9 Claims**



1. A sample transport vessel comprising:

a sample mounting block upon one end face of which a sample can be affixed;

a sample block carrier having one end adapted to receive and retain said sample mounting block;

a lid member having a sleeve affixed to one surface thereof and extending therefrom, said sleeve being adapted to accept thereinto said sample block carrier; and

means, carried by said sample block carrier for forming a hermetic seal between said sample block carrier and said sleeve.

7. A sample transfer system comprising in combination:

an analytical instrument having an preanalysis chamber and an entry chamber, said entry chamber and said preanalysis chamber being separated by a means for selectively allowing or blocking communication between said chambers said entry chamber being cooperatively formed to accept a sample transport vessel; said sample transport vessel including a sample mounting block upon one end face of which a sample can be affixed, a sample block carrier having one end adapted to receive and retain said sample mounting block, a lid member having a sleeve affixed to one surface thereof and extending therefrom said sleeve being adapted to accept thereinto said sample block carrier; means, carried by said sample block carrier for forming a hermetic seal between said sample block carrier and said sleeve; and

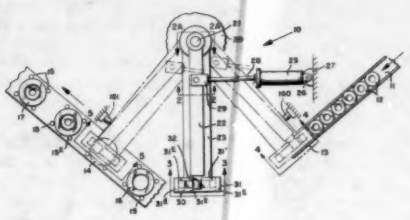
means for controlling the ambient pressure of said entry chamber.

4,411,576

PICK AND PLACE MECHANISM

William I. Smith, 59 Shannon Dr., North Wales, Pa. 19454, and Harold Moyer, Harleysville, Pa., assignors to William I. Smith, Collegeville, Pa.

Filed Aug. 26, 1981, Ser. No. 296,504
Int. Cl.³ B23Q *7/04*
U.S. Cl. 414—226 **33 Claims**



1. A pick and place mechanism for transferring a part from a pick location to a place location, comprising:

a casing,

means for displacing said casing in a predetermined path of movement between said locations,

means at each location for arresting motion of said casing,

cam means mounted in said casing for movement transversely to said path of movement,

follower means disposed in said casing for operating said cam means in response to arrested motion of said casing at said locations,

at least a pair of gripping fingers connected to said cam means and mounted in said casing for extension and retraction relative thereto, and

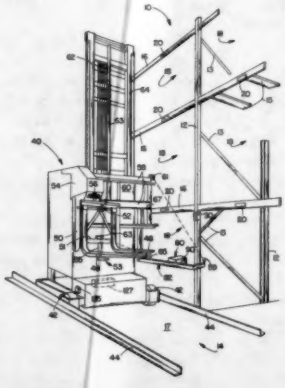
actuating means on said gripping fingers and said casing cooperable upon extension of said fingers through predetermined distances to grip or release a part.

4,411,577

VEHICLE SENSOR MONITORING SYSTEM

James T. Shearer, Jr., Ada, Mich., assignor to Rapistan Division, Lear Siegler, Inc., Grand Rapids, Mich.

Continuation-in-part of Ser. No. 128,261, Mar. 7, 1980, Pat. No. 4,331,417. This application Mar. 3, 1981, Ser. No. 240,172
Int. Cl.³ B65G *65/02*
U.S. Cl. 414—274 **14 Claims**



1. A system for checking the operation of one or more sensors used for controlling a vehicle employed for transfer-

ring articles into or out of storage locations of a warehousing system comprising:

first sensing means associated with the vehicle for providing signals employed in controlling the vehicle during a load transferring cycle of operation and which has a predictable operational status when detecting a predetermined condition normally encountered during a selected portion of each load transferring cycle of operation;

monitoring circuit means coupled to said first sensing means for determining the operational status of said first sensing means during said selected portion of each load transferring cycle of operation and for generating a fault control signal in the event the status of said first sensing means indicates that the predetermined condition is not sensed;

control circuit means coupled to said first sensing means and responsive to signals therefrom for providing vehicle controlling signals; and

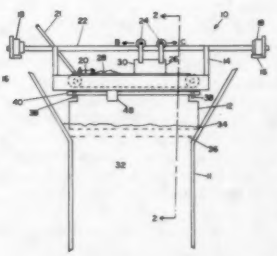
second sensing means which provides a predetermined output signal during said selected portion of each load transferring cycle of operation and logic circuit means coupled to said first sensing means and to said second sensing means to provide a fault control signal in the event that the predictable operational status of said first sensing means does not occur in the desired relationship to said predetermined output signal from said second sensing means.

4,411,578

SHUTTLE SPREADING CONVEYOR

Harold F. Morrow, Jr., Columbia, Pa., assignor to Aggregates Equipment, Inc., Leola, Pa.

Filed Sep. 25, 1981, Ser. No. 306,095
Int. Cl.³ B65G 65/32
U.S. Cl. 414—300 **4 Claims**



1. In a shuttle conveyor in which a movable trolley supports and transports a conveyor with means for unloading the conveyor at multiple points along its length, the improvement comprising:

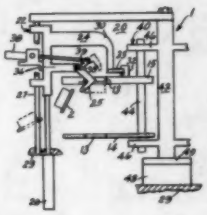
a free swinging drag leveler hung below and attached to the trolley, extending essentially the entire length of the conveyor, and of a weight sufficient so that, as the drag leveler is pulled forward by the shuttle conveyor, its lower edge trails behind that conveyor and when the drag leveler contacts a ridge of the surface of discharged material below the trolley, the drag leveler will pull the ridge of material into an adjacent valley.

4,411,579

EJECTION MEANS FOR REMOVING A HOLLOW ARTICLE FROM MACHINE IN WHICH THE ARTICLE IS MADE

Robert J. Grone, Elsmere, Ky., and Leonard R. Schnell, Okeana, Ohio, assignors to Cincinnati Milacron Industries, Inc., Cincinnati, Ohio

Filed Sep. 14, 1981, Ser. No. 301,775
Int. Cl.³ B29C 3/00
U.S. Cl. 414—417 **7 Claims**



1. An ejection means for removing a hollow article such as a cup from an upper one of a pair of rings mounted in a carrier plate comprising

a pair of vertically extending guide rods;

a yoke slidably mounted on said guide rods for vertical motion;

first power means to reciprocate said yoke up and down on said guide rods, said power means being located beneath said yoke;

a pair of carrier plates including a lower carrier plate and an upper carrier plate supported on said lower carrier plate, each of said carrier plates having a hole therethrough in register with the hole in the other plate;

a plurality of carrier lifting lugs extending upwardly from the upper surface of said upper carrier plate;

indexing means to move said carrier plates into an eject work station adjacent said yoke for ejection therefrom of cups carried therein;

a plurality of yoke lifting lugs supported from said yoke in position to be engaged by the carrier lifting lugs supported on said carrier plates by the time the indexing means has moved the carrier plates into said ejection position;

said upper ring being mounted on said upper plate surrounding said hole therein and in a position facing said lower carrier plate;

a finger pivotally mounted on said yoke in a position to strike the inside of the article through the hole in the upper carrier plate;

second power means mounted on said yoke to operate said finger; and

a resilient surface on the striking face of said finger.

4,411,580

VEHICLE ATTACHED SUPPORT FOR WHEELCHAIR TRANSPORT

Danny R. Kelly, P.O. Box 772, Nicoma Park, Okla. 73066

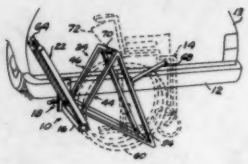
Filed Oct. 19, 1981, Ser. No. 313,059
Int. Cl.³ B60R 9/06
U.S. Cl. 414—462 **2 Claims**

1. In a wheelchair support for connection with an automotive vehicle bumper or other surface for transporting a folded wheelchair of the type having large rear wheels, the improvement comprising:

a base tube secured to and projecting longitudinally rearward from the vehicle adjacent the horizontal plane of the bumper;

a generally upright inverted U-shaped frame having legs rigidly secured to respective end portions of said base tube;

open framework means including spaced-apart vertically disposed side members projecting laterally of said base tube and pivotally connected at one end portion between the legs of said U-shaped frame for vertical pivoting movement of their laterally remote end portions from a downward earth surface contacting wheelchair loading and unloading position to an upward wheelchair supporting position, and a cross rod extending between the respective end portion of said side members adjacent their



lower limit and defining, in combination with said side members, a framework vertical opening having a length greater than the radius and less than the diameter of a wheelchair large wheels for subtending an arc of the periphery of the large wheels when supported therein and lowering the wheelchair center of gravity toward the plane of the framework opening; and,

spring urged latch means for securing said framework means to said U-shaped frame in a wheelchair lifted and supported position.

4,411,581

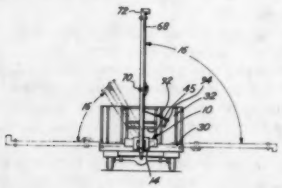
TRUCK AUGER-HOPPER CONSTRUCTIONS

Donald W. Niewold, 149 N. Market St., Paxton, Ill. 60957

Continuation-in-part of Ser. No. 221,293, Dec. 30, 1980. This application Nov. 27, 1981, Ser. No. 325,234

Int. Cl.³ B60P *1/04, 1/40*

U.S. Cl. 414—489 **46 Claims**



1. An auger-hopper construction for mounting to an inclinable body of a truck to receive material from the truck comprising:

first hopper means, said first hopper means having an opening adjacent the bottom thereof,

first hopper mounting means for mounting said first hopper means to the truck in a position to receive the material from the truck and such that no portion of said first hopper means extend substantially beneath a plane defined by the bottom of the inclinable body of the truck,

second hopper means having an opening therein,

pivotal mounting means for pivotally mounting said second hopper means to said first hopper means to receive material from said opening in said first hopper means, said pivotal mounting means permitting said second hopper means to pivot about an axis between upper and lower pivot limits, said pivotal mounting means mounting said second hopper means to said first hopper means such that the lowest portion of said second hopper means when pivoted to extend horizontally does not extend substantially beneath the plane defined by the bottom of the inclinable body of the truck when both hopper means are mounted to the truck,

auger tube means,

swivel mounting means mounting one end of said auger tube means to said second hopper means and overlying the opening therein to receive material from said latter opening,

said pivotal mounting means and swivel mounting means cooperating to permit inclination of said auger tube means in plane substantially perpendicular to the axis of the pivotal movement and also in inclination in a plane substantially parallel to the axis of the pivotal movement at substantially all angles of inclination of the truck body.

4,411,582

ELECTRONICALLY CONTROLLED INDUSTRIAL TRUCKS

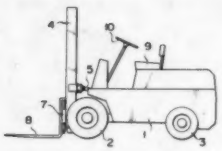
Shoichi Nakada, Matsudo, Japan, assignor to Komatsu Forklift Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 20, 1981, Ser. No. 236,191

Claims priority, application Japan, Aug. 20, 1979, 54-104974

Int. Cl.³ B66F *9/06;* **B66C** *13/16;* **B66B** *1/24*

U.S. Cl. 414—636 **8 Claims**



1. An electronic controller for controlling movements of a fork and a mast of a fork-lift truck wherein the movement of the fork is effected by a lifting mechanism and that of the mast is effected by a tilting mechanism, comprising:

first sensor means for detecting the movement of the fork and providing first signals denoting increments of that movement;

counter means for receiving said first signals and providing a count denoting the height of the fork along its range of movement;

memory means for storing data denoting the height of the fork and providing said stored data for comparison with said count;

means for effecting storage in said memory means;

first comparator means for comparing said count with the data from said memory means to provide a second signal for controlling the movement of the fork;

first actuator means adapted to receive said second signal and actuate said lifting mechanism in response thereto;

second sensor means for detecting an upright and a tilt-back position of the mast and providing a third signal to stop the mast movement;

second actuator means for actuating said tilt mechanism, said second actuator means being adapted to receive said third signal and to stop in response thereto;

base height switch means for providing a fourth signal indicating a predetermined base height whenever it is actuated by the fork;

second comparator means for comparing the count of said counter means with said fourth signal for correcting any errors of said count; and

a control board means including a plurality of switches for starting and stopping the movements of the fork and the mast, said control board means being operable by a human operator to provide for the storage of said count in a storage location wherein the address is determined by the operation of a particular switch and wherein the memory is addressable on subsequent operation of said particular

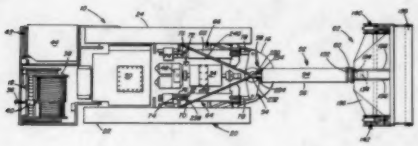
switch to provide the stored count to the first comparator means.

4,411,583

MULTI-PURPOSE MATERIAL HANDLING MACHINE FOR USE IN A MINE

Angelo S. Petitto, Sr.; Angelo A. Petitto, and James L. Petitto, all of Morgantown, W. Va., assignors to Petitto Mine Equipment Repair, Inc., Morgantown, W. Va.

Filed Oct. 27, 1980, Ser. No. 201,277
Int. Cl.³ B60P 1/54
U.S. Cl. 414—687 13 Claims



1. A multi-purpose underground material handling machine comprising,

a mobile body,

a boom assembly extending from said mobile body,

said boom assembly having a first end portion positioned on said mobile body and a second end portion spaced from said first end portion and said mobile body,

said second end portion being extensible and retractable relative to said first end portion to change the length of said boom assembly,

said boom assembly first end portion being pivotally connected to said mobile body for both lateral and vertical pivotal movement of said boom assembly relative to said mobile body,

first actuating means mounted on said mobile body and connected to said boom assembly for pivoting said boom assembly both laterally and vertically relative to said mobile body,

a multi-purpose bucket including a movable portion and a carrier portion,

pivot means for connecting said movable portion to said carrier portion to permit pivotal movement of said movable portion toward and away from said carrier portion,

second actuating means extending between said bucket movable and carrier portions for moving said movable portion to a preselected operating position relative to said carrier portion,

said carrier portion including a pair of laterally spaced side walls secured to both a back wall and a bottom wall to form an enclosure with an open end portion to receive loose material,

said movable portion including a pair of laterally spaced side walls secured to a bottom wall whereby loose material is frc..ly movable through said movable portion,

said movable portion being positioned within said carrier portion such that said movable portion side walls are positioned inboard and closely adjacent to said carrier portion side walls for movement of said movable portion side walls relative thereto,

said movable portion bottom wall being movable in overlying relation with said carrier portion bottom wall,

a bracket extending forwardly from said boom assembly second end portion,

a bracket receiver extending rearwardly from said bucket carrier portion into contact with said bracket with said boom assembly positioned centrally behind said multi-purpose bucket,

quick release pin means for connecting said bracket receiver to said bracket to permit efficient attaching and detaching of said multi-purpose bucket to said boom assembly, and

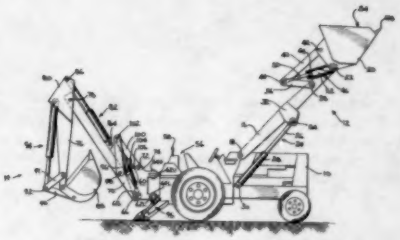
extensible means for extending and retracting said boom assembly to selectively manuever said multi-purpose bucket into position for conducting material handling operations.

4,411,584

OPTIMIZED EARTHWORKING TOOL OPERATING LINKAGE

John F. Shumaker, Mt. Pleasant, Iowa, assignor to J. I. Case Company, Racine, Wis.

Filed Jan. 26, 1981, Ser. No. 228,606
Int. Cl.³ E02F 3/32
U.S. Cl. 414—694 1 Claim



1. Apparatus for operating a bucket between a loaded and a dumped position, said bucket being pivoted to a lift arm by first pivotal connection means, comprising:

(a) a first link pivotally connected at one of its ends to said lift arm at a spaced distance from said first pivotal connection means;

(b) a second link pivotally connected at one of its ends to said bucket at a spaced distance from said first pivotal connection means and disposed towards said first link;

(c) second pivotal connection means, for pivotally connecting the opposite ends of said first link and said second link; and

(d) extensible means, pivotally connected at one of its ends to said first pivotal connection means and pivotally connected at its opposite end to said second pivotal connection means for moving said second pivotal connection means towards and away from said first pivotal connection means, said extensible means comprising a hydraulic actuator having a cylinder, a piston disposed to move reciprocally within said cylinder and a piston rod connected to said piston, one end of said cylinder being pivotally connected to said first pivotal connection means and the free end of said piston rod being pivotally connected to said second pivotal connection means, whereby the head side of said piston is pressurized to extend said hydraulic actuator and move said bucket from its dumping position to its loaded position, and contraction of said hydraulic actuator pivots said bucket to its dumped position relative to said base member, and thus the available force pivoting said bucket from its dumped to its loaded position is greater than the force used to pivot said bucket from its loaded to its dumped position.

4,411,585

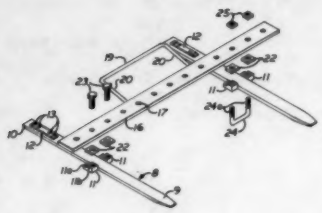
FORK ATTACHMENT FOR LOADER BUCKETS

Russell C. Quinn, Twinsburg, Ohio, assignor to Jos. Dyson and Sons, Inc., Eastlake, Ohio

Filed Mar. 16, 1981, Ser. No. 244,298
Int. Cl.³ B66F 9/12
U.S. Cl. 414—724 1 Claim

1. An attachment for a loader bucket comprising a pair of substantially generally flat fork bodies, each said body including a lifting section and a bucket engaging portion, each bucket engaging portion having a stop element connected to the bucket engaging portion to coact with a shoulder form at the underside of such bucket, bucket edge gripping means for

frictionally positioning such means on the upper side at an edge of such bucket, said gripping means extending between said bodies and comprising a transversely elongated member having provisions for receiving fasteners which do not penetrate



the bucket or bucket edge, and which engage said gripping and fastening means to prevent displacement of the fork bodies from such loader bucket, and fastening means for the fork body positioned in the elongated member to retain the fork bodies in related positions.

4,411,586

DEVICE FOR DELIVERY OF CORES

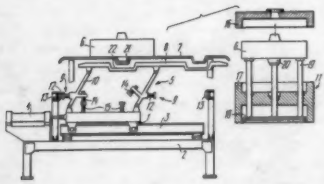
Vitaly A. Zitser, ulitsa Pervomaiskaya, 9/14, kv. 17, Dolgoprudny, Moskovskaya oblasti; Leonid V. Bachelis, Schelkovskoe shosse, 91, korpus 2, Moscow; Alexandr V. Meinikov, ulitsa Dorozhnaya, 7, korpus 1, kv. 138, Moscow; Igor I. Dreishev, Volgogradsky prospekt, 181, kv. 33, Moscow; Nikolai K. Shishkin, ulitsa Yablochkova, 29, kv. 17, Moscow; Jury E. Morozov, Leninsky prospekt, 39/1, kv. 264, Moscow; Vladimir A. Ivanov, ulitsa Rustaveli, 3, korpus 6, kv. 34, Moscow; Semen A. Olshansky, Dmitrovskoe shosse, 37, kv. 306, Moscow, and July V. Ryabinin, Altufievskoe shosse, 30, kv. 210, Moscow, all of U.S.S.R.

Filed Jul. 15, 1981, Ser. No. 283,787

Claims priority, application U.S.S.R., Jul. 15, 1980, 2944501

Int. Cl.³ B66F *9/02*

U.S. Cl. 414—728 **8 Claims**



1. A core delivery device of a machine for making cores from fluidized sands in hot boxes, comprising:

a support frame;

a trolley mounted for reciprocation on said support frame;

bearing plate bars mounted on said support frame, said bearing plate bars being shaped to correspond to the configuration of the cores and being situated in a substantially fixed horizontal plane;

means for receiving the said cores and delivering them onto said bearing plate bars, said means being constituted by a pantograph mounted on said trolley and having rotatable bars and bars adapted to receive said cores, the core receiving bars being arranged on the pantograph side opposite to the trolley, said core receiving bars being shaped to correspond to the configuration of the cores and being situated in a substantially horizontal plane; and

a mechanism for lifting and lowering said core receiving bars between lower and upper positions, said plane in which said core receiving bars are situated being situated below said plane in which said bearing plate bars are situated when said core receiving bars are in said lower position and above said plane in which said bearing plate bars are situated when said core receiving bars are in said upper position.

4,411,587

LOADING APPARATUS

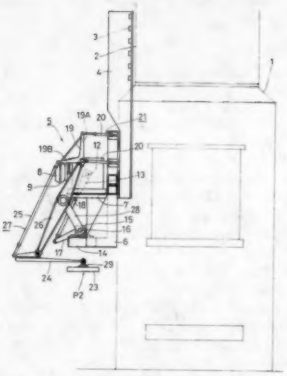
Akira Niki, Toyoake, Japan, assignor to Nagoya Kiko Kabushiki Kaisha, Toyoake, Japan

Filed Jul. 14, 1981, Ser. No. 283,161

Claims priority, application Japan, Jul. 30, 1980, 55-104867; Sep. 17, 1980, 55-129964; Jun. 23, 1981, 56-98009

Int. Cl.³ B30B *15/30*

U.S. Cl. 414—752 **4 Claims**



1. A loading apparatus for use in combination with a working machine comprising:

an L-shaped mounting frame (6) having a vertical side and a horizontal side and fixedly connected to said working machine in vertical alignment and generally above the working position;

a first quadric parallel link (21) having two spaced parallel rods (20), one end of each rod (20) being pivoted to the vertical side of said L-shaped mounting frame (6);

a floating L-shaped parallel travel member (19) having a vertical side (19A) and a horizontal side (19B), said vertical side (19A) being pivoted to the other ends of said rods (20);

a second quadric parallel link (27) having a primary rod (26) and a secondary rod (25) both being pivoted at one end to said horizontal side (19B) of said floating L-shapetl parallel travel member (19);

a holder arm assembly (24) pivoted to the other ends of said primary rod (26) and said secondary rod (25) and constituting one side of a said second quadric parallel link (27), said holder arm assembly (24) including a venturi cap (29) operatively connected thereto for holding a workpiece (23);

a coupling shaft (16) rotatably mounted to the horizontal side of said L-shaped mounting frame (6) through a bearing means (15);

a first oscillating arm (28) pivotally connected at one end to said primary rod (26) of said second quadric parallel link (27) intermediate the ends of said primary rod (26) and at the other end to one end of said coupling shaft (16);

an electric motor (10) with a reduction gear (11) fixedly connected to the vertical side of said L-shaped mounting frame (6) through a bracket (7), said reduction gear having an output shaft (12);

a crank arm (13) pivotally connected at one end to said output shaft (12) of said reduction gear (11); and

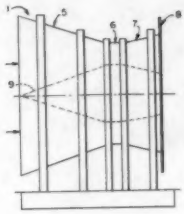
a second oscillating arm (17) pivotally connected at one end to the other end of said coupling shaft (16) and at the other end to the other end of said crank arm (13) through a rod (18).

4,411,588

WIND DRIVEN POWER PLANT

Walter E. Currah, Jr., 4401 S. 64th St., Tacoma, Wash. 98409, assignor to Walter E. Currah, Tacoma, Wash.

Continuation of Ser. No. 900,780, Apr. 28, 1978, abandoned.
This application Feb. 20, 1981, Ser. No. 236,269
Int. Cl.³ F03D 1/04
U.S. Cl. 415—2 A 1 Claim



1. An apparatus for converting wind energy to electrical energy, said apparatus comprising:

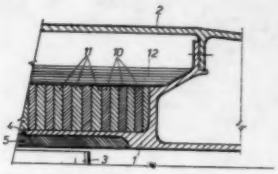
an inner and an outer housing both formed as surfaces of revolution about a common longitudinally extending axis to define therebetween a forwardly facing wind entry opening and entry chamber, an intermediate wind chamber, and a rearwardly facing wind expansion chamber and wind exit opening; said outer housing defined by a frustrum of a first outer right circular cone oriented along said longitudinally extending axis with its larger open end defining said wind entry opening, an outer cylinder connected to the smaller end of said frustrum, and a frustrum of a second outer right circular cone oriented along said longitudinally extending axis with its smaller end connected to said cylinder and its larger end defining said wind exit opening, and a flat radially extending annular plate connected to the rearwardly facing end of the frustrum of said second right circular cone in a plane normal to the longitudinal axis for providing an increased pressure differential between said wind entry and exit openings; said inner housing defined by a first inner right circular cone concentric with and coextensive with said first-mentioned outer right circular cone and oriented along said longitudinally extending axis with its smaller end facing in the direction of said wind entry opening to define said wind entry chamber therebetween, an inner cylinder concentric with and coextensive with said outer cylinder and connected to the larger end of said first inner right circular cone to define said intermediate chamber, and a conically converging member having its larger end connected to said inner cylinder member to define, with said second outer right circular cone, the wind expansion chamber; at least one turbine rotor blade row and hub assembly mounted in said wind expansion chamber at the rearward end of the frustrum of said second right circular cone for rotation about said longitudinally extending axis in a plane normal to the longitudinal axis, said blade row axially positioned so that said flat radially extending annular plate lies in a plane between the forward and rearward edges of said blade row; said blade row and hub assembly connected to an electrical energy generator means mounted within said inner housing for generating electricity in response to rotation of said turbine rotor; and support means connected between said inner and outer housings.

4,411,589

RETAINING DEVICE FOR THE COMPRESSOR CASING OF A TURBINE ENGINE

Raymond J. M. Joubert, Savigny sur Orge, and Marcel R. Soligny, Chevilly-Larue, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.", France

Filed Oct. 21, 1980, Ser. No. 199,192
Claims priority, application France, Oct. 23, 1979, 79 26580
Int. Cl.³ F01D 21/00
U.S. Cl. 415—9 7 Claims



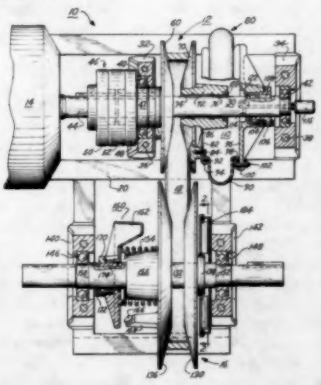
1. A retaining device for the compressor casing of a dual flow turbo-jet engine having a metal ferrule coaxial with the axis of the compressor, the metal ferrule having on its internal surface facing the tips of the blades a material capable of entering into non-destructive contact with the tips of the blades, wherein the retaining device comprises: a plurality of first circular rings disposed about the external surface of the ferrule such that their axes coincide with the axis of the compressor, the first circular rings of material capable of frictionally amortizing the kinetic energy of a blade or blade fragment coming into contact therewith; and, a plurality of second circular rings disposed coaxially with the first circular rings and located between each of the first rings such that the first and second rings alternate in a direction along the axis of the compressor, the second circular rings being formed of a high-strength material different from the material forming the first rings.

4,411,590

CONTROL SYSTEM FOR VARIABLE SPEED BELT DRIVES

Richard L. Meredith, Mishawaka, Ind., assignor to Reliance Electric Company, Mishawaka, Ind.

Filed Dec. 8, 1980, Ser. No. 214,196
Int. Cl.³ F01B 25/02
U.S. Cl. 415—26 17 Claims



13. A control system for a variable speed belt drive having a rotatable input element with a movable flange, a rotatable output element and a speed control element: a control mecha-

nism, a fluid pressure actuated means connected to said control mechanism for regulating the speed of said input element, a fluid pressure creating means responsive to the speed of said output element connected to said control mechanism, a source of command pressure connected to said control mechanism, a source of operating pressure connected to said control mechanism, and means in said control mechanism for regulating the pressure from said source of operating pressure to said speed control element for controlling the speed of said rotatable input element in response to variations in pressure from the pressure creating means and from said command pressure source.

4,411,591

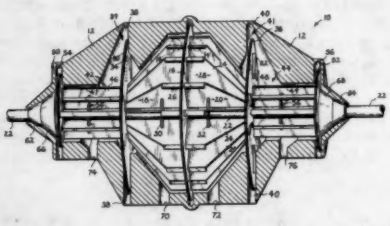
PADDLE WHEEL TURBINE DEVICE

Daniel O. Hesting, R.R. 2 - Tulakes, Chanute, Kans. 66720

Filed Jun. 15, 1981, Ser. No. 273,748

Int. Cl.³ F01D *5/06*

U.S. Cl. 415—103 **13 Claims**



1. In a turbine having a power shaft for operating apparatus connected thereto, the improvement being means for rotating said shaft comprising:

a plurality of turbine blades mounted about said power shaft in a peripherally spaced-apart relationship and presenting a paddle wheel configuration to said blade array;

at least one inlet port for directing a pressurized fluid into said turbine;

at least one exhaust port for discharging said fluid from said turbine, said inlet port and said exhaust port defining a fluid flow path and positioned in an apex/nadir relationship relative to said paddle wheel blade array for interposition of said blade array in said fluid flow path in a rotating response thereto, whereby to drive said power shaft;

said turbine blades further comprising:

a generally planar surface extending from said shaft, said surface having an edge radially displaced from the axis of said shaft;

a flanged surface normally extending from said edge and in the direction of said rotation, said planar surface responding to said fluid flow with said rotating movement and cooperating with said flanged surface to maintain movement of said fluid between said inlet and exhaust ports; and

at least one continuous rod passing through each of said blades, said rod made of a material having a greater rate of expansion than said blade material with said relative rate of expansion providing for reinforcement of said blades by said rod during said rotating response.

4,411,592

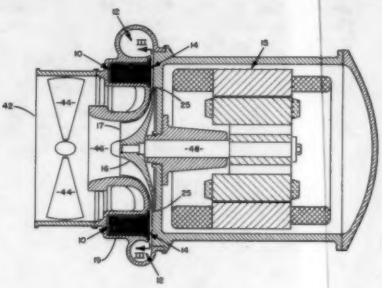
PRESSURE VARIATION ABSORBER

Darwin G. Traver, DeWitt; Carl M. Anderson, Syracuse, both of N.Y., and Amr N. Abdelhamid, Luzerne, Canada, assignors to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 815,330, Jul. 13, 1977, abandoned. This application Feb. 23, 1979, Ser. No. 14,525

Int. Cl.³ F04D *29/66*

U.S. Cl. 415—119 **10 Claims**



1. A centrifugal compressor for increasing the pressure of a compressible fluid including

a housing defining a fluid path including an inlet opening, an impeller chamber, and a circumferentially extending discharge opening,

an impeller rotatably mounted within the impeller chamber to accelerate fluid entering through the inlet opening and to discharge fluid through the discharge opening with increased pressure and velocity,

an annular collector spaced from the discharge opening of the housing positioned to receive compressed fluid from the impeller, and

a radial annular diffuser including side walls defining a passageway extending between the discharge opening and the collector to receive fluid of high velocity and low static pressure from the discharge opening and to supply the fluid to the collector at lower velocity and higher static pressure, and

means in the diffuser for absorbing aerodynamic pressure variations in the fluid, said means including a porous material forming a portion of one wall of the diffuser and a resonant cavity in fluid communication with the diffuser through the porous material, whereby pressure variations in the fluid are absorbed in the diffuser to increase the operation flow range of the compressor.

4,411,593

ROTARY TYPE PUMP RESISTANT TO MUDDY WATER

Michihiro Taguchi, Hamamatsu, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Jun. 25, 1980, Ser. No. 162,909

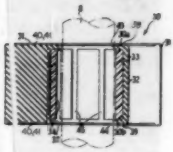
Claims priority, application Japan, Jul. 30, 1979, 54-96961

Int. Cl.³ F04D *29/28*

U.S. Cl. 415—173 R **7 Claims**

1. In a rotary type liquid pump having an axis, a pump chamber surrounding said axis, a pair of chamber faces lying parallel to one another and normal to said axis, a rotary shaft axially mounted in said pump chamber and having a cylindrical periphery in said pump chamber, with a keyway therein, a boss made of elastic material and bearing impeller blades, a tubular bush made of material more rigid than the material of the boss fitted into said boss, having a keyway opposite the keyway on said shaft, a key seated in said keyways and joining said shaft and bush, the improvement comprising said cylindrical periphery being smooth, a flexible annular seal on each end of said

boss engaging the said periphery, and extending between said seals, and fitting between said bush and said shaft, a connector



extending between and connecting with said seals, and making a fluid sealing abutting fit against said periphery.

4,411,594

SUPPORT MEMBER AND A COMPONENT SUPPORTED THEREBY

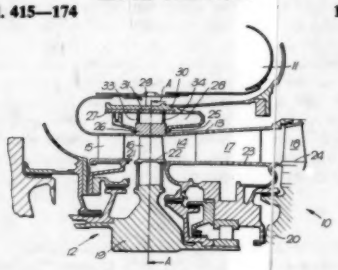
Terence R. Pellow, Watford, and Derek A. Glew, Alveston, both of England, assignors to Rolls-Royce Limited, London, England

Continuation-in-part of Ser. No. 151,886, May 20, 1980, abandoned. This application Jun. 22, 1982, Ser. No. 390,930

Claims priority, application United Kingdom, Jun. 30, 1979, 7922802; Apr. 28, 1980, 8013985

Int. Cl.³ F01D 11/08

U.S. Cl. 415—174 **14 Claims**



1. A structure comprising;

an annular support member;

an annular component, said annular support membersurrounding said annular component, and said annular component being continuous and being capable of floating radially relative to said support member; and

sealing means resiliently supporting said annular component from said support member in spaced relationship therewith while permitting said annular component to have independent floating radial movement relative to said annular support member without any significant load transfer therebetween, said sealing means including an array of upstanding resilient filaments having fixed ends and free ends, said fixed ends of said array of upstanding resilient filaments being fixed to one of said annular support member and said annular component and the free ends of said annular array of filaments engaging the other of said annular support member and said annular component, said array of upstanding resilient filaments defining a brush seal between said annular support member and said annular component.

4,411,595

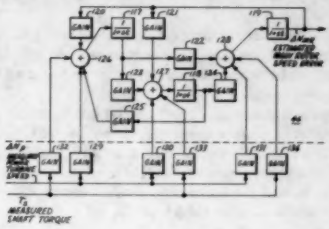
CONTROL SYSTEM FOR GAS TURBINE ENGINE

Alan D. Pisano, Chelsea, Mass., assignor to General Electric Company, Cincinnati, Ohio

Division of Ser. No. 76,890, Sep. 19, 1979, Pat. No. 4,276,744. This application Feb. 9, 1981, Ser. No. 232,925

Int. Cl.³ F02C 3/10

U.S. Cl. 416—1 **3 Claims**



1. Estimator means for use in combination with a helicopter powered by a gas turbine engine, the helicopter including a main rotor and a tail rotor coupled to turbine output shaft means, wherein the estimator means comprises:

(a) first signal processing means forming a simplified representation of said main rotor and tail rotor of said helicopter;

(b) second signal processing means coupled to receive a first input signal representative of the difference between a desired rotational speed of said output shaft means and the actual rotational speed of said output shaft means and to receive a second input signal representative of the torque at said output shaft means, said second signal processing means including separate gain means for respectively providing said first and second input signals with predetermined gains;

(c) third signal processing means for coupling said second signal processing means to said first signal processing means wherein said first signal processing means is caused to be an actual representation of said main rotor and tail rotor of said helicopter and wherein the output signal of said first signal processing means is representative of the main rotor speed error.

4,411,596

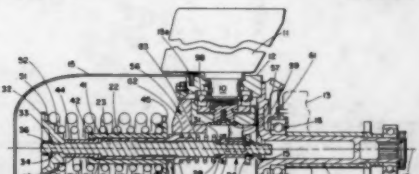
RAM AIR TURBINE CONTROL SYSTEM

John A. Chilman, Gloucester, England, assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 25, 1980, Ser. No. 133,766

Int. Cl.³ F01D 7/02

U.S. Cl. 416—51 **25 Claims**



1. A blade pitch control mechanism for a ram air driven turbine blade mounted for rotation in a hub assembly, said mechanism including:

a drive member mounted for reciprocation along a central axis, said drive member having a control member and a seat member secured to said drive member;

said blade having operatively coupled thereto a centrifugally responsive means which includes a pin in mating engagement with said control member;

biasing means acting between said hub assembly and said control member to thereby cause said blade to assume a coarse pitch position when said blade and hub assembly are in storage;

a slide member mounted on a portion of the hub assembly for reciprocation along said central axis and having a resilient means between said seat member and said slide member, and

flyweight means supported on said hub assembly and engaging said slide member, rotation of said hub assembly causes said flyweight means to move said slide member and thereby move the blade pitch from coarse pitch to fine pitch, and thereafter allow said centrifugally responsive means to control the blade pitch.

4,411,597

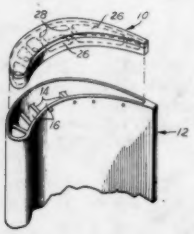
TIP CAP FOR A ROTOR BLADE

William K. Koffel, Cincinnati; Eugene N. Tuley, Hamilton; Charles H. Gay, Jr., Loveland; Raymond E. Troeger, Fairfield, all of Ohio, and Albert P. Sterman, deceased, late of Cincinnati, Ohio by Florence G. Sterman, executrix, assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 20, 1981, Ser. No. 245,571

Int. Cl.³ F01D *5/18*

U.S. Cl. 416—92 **17 Claims**



1. A replaceable tip cap for attachment to the radially outer end of a hollow rotor blade, said tip cap comprising:

(a) two curved sidewalls joined at leading and trailing edges thereof and defining an airfoil shape,

(b) a radially outer wall and a pressure maintaining radially inner wall, both joined to the curved sidewalls to form a compartment, the radially inner wall having a plurality of holes extending therethrough, and

(c) a plurality of bulkheads contained within the compartment for defining several subcompartments, each subcompartment for containing air at a different pressure, and each subcompartment communicating with at least one of the holes in the radially inner wall.

4,411,598

FLUID PROPELLER FAN

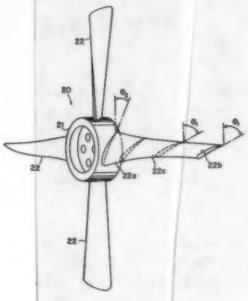
Makoto Okada, Tokyo, Japan, assignor to Nissan Motor Company, Limited, Kanagawa, Japan

Filed Dec. 3, 1980, Ser. No. 212,430

Claims priority, application Japan, Dec. 12, 1979, 54-171946[U]

Int. Cl.³ F04D *29/38*

U.S. Cl. 416—223 R **1 Claim**



1. A fluid propeller fan including a fan wheel rotor assembly which comprises:

a wheel hub having an axis therethrough and rotatable about the axis; and

a plurality of vanes extending radially outwardly from said wheel hub and angularly spaced apart from each other about said axis of the wheel hub, each of the fan vanes having a predetermined pitch angle with respect to a plane perpendicular to said axis of said wheel hub;

wherein each of said vanes is provided with a radially outer longitudinal portion having, with respect to said plane, a pitch angle which is substantially constant throughout the length of said portion and a radially inner longitudinal portion having, with respect to said plane, a pitch angle which gradually decreases toward said wheel hub from said radially outer longitudinal portion.

4,411,599

DRAIN FITTING WITH BUILT-IN PUMP

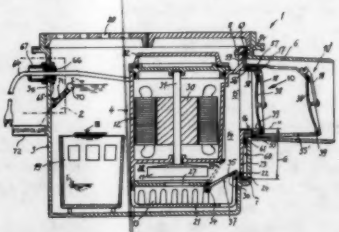
Bernhard Kessel, Bahnhofstr. 31, 8071 Lenting, Fed. Rep. of Germany

Filed Oct. 1, 1981, Ser. No. 307,587

Claims priority, application Fed. Rep. of Germany, Oct. 2, 1980, 3037217

Int. Cl.³ F04B *49/08, 17/00*

U.S. Cl. 417—301 **14 Claims**



1. A drain fitting comprising:

a vessel formed with a laterally open outlet, at least one inlet, and an internal seat at said outlet;

a pump in said vessel and having

a pump housing secured to said seat and having a pump

intake and a pump output extending into said outlet above said intake, said pump housing being substantially closed except at said output and intake, whereby said pump housing acts as a gas trap, said pump housing being formed with a pump passage and a bypass passage, said passages forming the only connection between said inlet and said outlet, whereby flow between said inlet and outlet must be through said passages,

an impeller in said pump passage displaceable to move liquid through said pump housing from said intake to said output,

a valve member displaceable between one position blocking said pump passage and permitting flow through said bypass passage and another position blocking said bypass passage and permitting flow through said pump passage and over said impeller, and

means including a motor in said pump housing for driving said impeller and thereby moving said valve member into the other position;

a check valve in said pump output preventing liquid flow back into said pump housing; and

seal means between said pump output and said outlet for preventing flow from said vessel into said outlet except through said pump output;

means releasably securing said pump on said seat in said vessel.

4,411,600

HERMETIC MOTOR COMPRESSOR

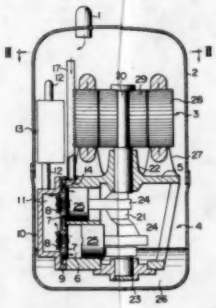
Masato Itagaki; Fumio Harada, and Tetsuya Arata, all of Shimizu, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 10, 1980, Ser. No. 205,110

Claims priority, application Japan, Nov. 9, 1979, 54-144392

Int. Cl.³ F04B *39/00*

U.S. Cl. 417—312 **6 Claims**



1. A hermetic motor compressor having a motor compressor unit including an upper motor section and a lower compressor section connected with each other, and a closed housing accommodating said motor compressor unit and having a refrigerant gas return pipe connected to an upper part thereof so that the space in said closed housing is filled with the atmosphere of suction pressure of said refrigerant gas, said compressor section having a suction passage extending upward from an upper portion thereof and opening to an upper part of said space in said closed housing so as to introduce said refrigerant gas into said compressor section, characterized in that a suction valve and a discharge valve are provided on a cylinder head, that only a discharge chamber is in a head cover attached to said cylinder head, while a suction chamber is formed in a frame body having a cylinder, at a corner portion thereof to have a small volume, and that said suction passage is made of a synthetic resin and extends upward from the suction chamber; wherein said suction pipe is constituted by at least one suction pipe, the wall of said suction pipe being cut and removed partially to provide an arcuate pipe portion over a predetermined length from the bottom of said suction pipe, and wherein said suction chamber is constituted by a plurality of suction chamber sections arrayed in the direction of said suction pipe, said arcuate pipe portion of said suction pipe being extended and opened into said suction chamber sections.

4,411,601

PUMP FOR METERING TWO DISTINCT FLUIDS

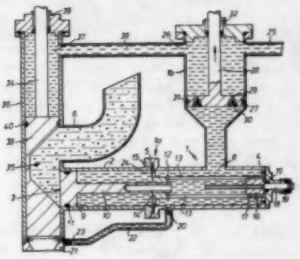
Albert C. Hersom, Beaconsfield, and Kenneth W. Wright, Twyford, both of England, assignors to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Feb. 20, 1981, Ser. No. 236,173

Claims priority, application United Kingdom, Dec. 16, 1980, 8040195

Int. Cl.³ F04B *15/02, 21/02*

U.S. Cl. 417—388 **11 Claims**



1. A pump for metering two fluids comprising a cylinder having a first and second inlet conduit and an outlet conduit, means for closing the communication between the cylinder and the first inlet conduit and between the cylinder and the outlet conduit alternately, there being present inside the cylinder a first floating solid piston for drawing in a primary fluid from the first inlet conduit and discharging it into the outlet conduit and a second piston for drawing in a secondary fluid from the second inlet conduit which piston has at least one port provided with one or more valves through which the secondary fluid can flow to occupy the space between the two pistons where it can transmit the motion of the second piston to the first piston, and a by-pass for conveying secondary fluid from the space between the pistons to the outlet conduit said by-pass having means permitting the operation of the by-pass during the entire operating cycle of the pump.

4,411,602

FUEL INJECTION APPARATUS FOR INTERNAL COMBUSTION ENGINES

Earl L. Ray, 113 Chestnut Pl., Rte. 2, Box 393A, Arden, N.C. 28704

Continuation-in-part of Ser. No. 11,425, Feb. 12, 1979, Pat. No. 4,275,689, which is a continuation-in-part of Ser. No. 814,662, Oct. 27, 1977, abandoned. This application Sep. 30, 1980, Ser. No. 192,310

Int. Cl.³ F04B *45/06*; F01B *19/00*

U.S. Cl. 417—437 **3 Claims**

1. A fuel injection apparatus for supplying pulsating fuel streams comprising:

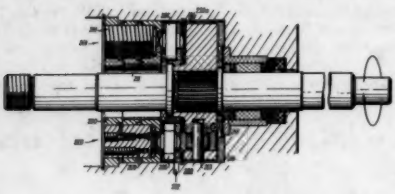
first and second injection pumps mounted on different sides of an axis of a rotating shaft, each of said injector pumps comprising a compartment separated by a steel diaphragm into a fuel receiving compartment and an oil receiving compartment, said diaphragm displaceable in a direction parallel to said axis into said fuel receiving compartment;

a fuel inlet including a spring load valve for emitting fuel to said fuel receiving compartment;

a fuel outlet including a spring loaded ball member for re-

ceiving a stream of fuel from said fuel receiving compartment in response to a displacement of said diaphragm;

first and second actuating members having first and second ends entering said oil receiving compartment in contact with said diaphragm for axially displacing said diaphragms; a rotating disk having an axis of rotation coincident with said rotating shaft axis, said disk including a cam



roller on a radius of said disk facing said actuator members for alternately striking each of said actuating members whereby each diaphragm is alternately displaced to produce pulsating streams from said fuel outlets; and

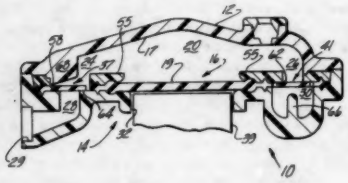
means for supplying oil pressure to said oil receiving compartment whereby said diaphragm is prohibited from blowing outward due to fuel pressure.

4,411,603

DIAPHRAGM TYPE BLOOD PUMP FOR MEDICAL USE

Michael J. Kell, Decatur, Ga., assignor to Cordis Dow Corp., Miami, Fla.

Filed Jun. 24, 1981, Ser. No. 276,752
Int. Cl.³ F04B *43/02*; A61M *5/00*
U.S. Cl. 417—479 **9 Claims**



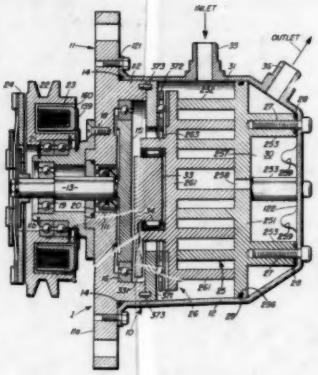
1. A blood pump for medical use comprising body means defining a blood chamber portion, a plunger receiving opening, and inlet and outlet conditions; a diaphragm of resiliently flexible material extending across and sealing said opening from said chamber portion and cooperating with said chamber portion to define a blood chamber, said diaphragm being movable in a pumping action for alternately reducing and increasing the volume of said blood chamber; said inlet and outlet conduits communicating with said blood chamber; inlet and outlet flapper valves or resiliently yieldable flexible material associated with said inlet and outlet conduits respectively for alternately closing and opening the communication between said inlet conduit and chamber and simultaneously opening and closing the communication between said outlet conduit and chamber upon said pumping action of said diaphragm reducing and increasing said volume respectively; each flapper valve comprising a single element of resiliently yieldable flexible material having a disc portion, a fixed portion, and a web portion connecting said disc and fixed portions; the disc portion of each flapper valve overlying the opening of its associated conduit into said blood chamber and being sufficiently thick to resist collapsing into the latter opening in response to fluid pressure changes in said blood chamber during said pumping action, the fixed portion of each flapper valve having a thickness substantially equal to the thickness of the disc portion and being secured to said body means, and the web portion of each flapper valve being reduced in both width and thickness with respect to the disc portion to effect a highly flexible hinge facilitating alternate opening and closing hinge movement of the connected disc portion; and means for limiting opening hinge movement of each disc portion to a predetermined small angle comprising a separate ramp portion of said body means extending at said angle from adjacent to each web portion and in the downstream direction of fluid flow.

4,411,604

SCROLL-TYPE FLUID DISPLACEMENT APPARATUS WITH CUP SHAPED CASING

Kiyoshi Terauchi, Isesaki, Japan, assignor to Sanden Corporation, Gunma, Japan

Filed May 5, 1981, Ser. No. 260,826
Claims priority, application Japan, May 7, 1980, 55-59461
Int. Cl.³ F01C *1/02, 19/00, 21/10*
U.S. Cl. 418—55 **15 Claims**

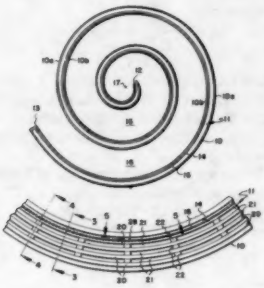


1. In a scroll-type fluid displacement apparatus including a housing having a front end plate member with an end surface, a fixed scroll member fixedly disposed within said housing and having a first circular end plate from which a first wrap extends, an orbiting scroll member having a second end plate from which a second wrap extends and said first and second wraps interfitting at an angular offset to make a plurality of line contacts to define at least one pair of sealed off fluid pockets, and a driving means including a drive shaft which penetrates said front end plate member and is rotatably supported thereby for effecting the orbital motion of said orbiting scroll member by the rotation of said drive shaft while the rotation of said orbiting scroll member is prevented, whereby said fluid pockets change volume by the orbital motion of said orbiting scroll member, the improvement comprising said housing comprises a cup shaped casing with an inner cylindrical surface and said front end plate member having an annular the improvement comprising said housing comprises a cup shaped casing with an inner cylindrical surface and said front end plate member having an annular projection extending from said end surface thereof and facing an opening in said cup shaped casing, said cup shaped casing being received about said first and second end plates and said annular projection with its inner surface in fitting engagement about the peripheral surface of said first circular end plate and the peripheral surface of said annular projection, and said fixed scroll member fixedly held within the interior of said cup shaped casing by a plurality of screw members screwed from the outside of said cup shaped casing into a fixed member formed integral with said end plate and which is disposed between the end surface of said first end plate which is opposite to the side thereof from which said first wrap extends and the inner surface of said cup shaped casing.

4,411,605
INVOLUTE AND LAMINATED TIP SEAL OF LABYRINTH TYPE FOR USE IN A SCROLL MACHINE

John R. Sauls, La Crosse, Wis., assignor to The Trane Company, La Crosse, Wis.

Filed Oct. 29, 1981, Ser. No. 316,261
Int. Cl.³ F01C 1/02, 19/08; F16J 15/16
U.S. Cl. 418—55 27 Claims

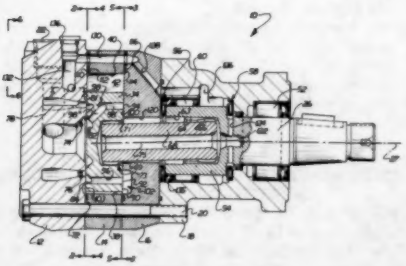


1. For use in a positive fluid displacement apparatus of the scroll type, a tip seal comprising a plurality of material strips, generally coaligned in side-by-side parallal relationship along a common spiral path about an axis, one or more of said strips including a plurality of notches along at least one edge thereof, which in conjunction with one or more other of the strips and an axially adjacent flat surface against which said edge may abut, define a plurality of labyrinth pockets longitudinally spaced apart along the strips.

4,411,606
GEROTOR GEAR SET DEVICE WITH INTEGRAL ROTOR AND COMMUTATOR

Laurence L. Miller, West Lafayette, Ind., assignor to TRW, Inc., Cleveland, Ohio

Filed Dec. 15, 1980, Ser. No. 216,368
Int. Cl.³ F01C 1/02
U.S. Cl. 418—61 B 14 Claims



1. A hydraulic device comprising:

(a) a gerotor gear set comprising

(i) a stator with a number of internal teeth equal to N,

(ii) a rotor with a number of external teeth equal to N − 1,

(iii) the teeth of the rotor and stator intermeshing and forming a number of expansible and contractible fluid pockets equal to N,

(iv) the rotor having a central axis which is eccentric to the central axis of the stator,

(v) the rotor rotating and orbiting relative to the stator to expand and contract the fluid pockets;

(b) first and second housing portions located adjacent opposite axial sides of said gerotor gear set,

(c) one axial end face of said rotor and the adjacent face of said first housing portion cooperating to form separate pressure areas which are continuously communicated with high and low pressure, respectively, as the rotor rotates and orbits,

characterized in that

(i) the other axial end face of said rotor has a circular array of openings equal to twice the number of teeth on the rotor,

(ii) passages formed in the rotor and extending through the rotor to continuously communicate adjacent openings with pressure areas at different pressures and alternate openings with pressure areas at the same pressure,

(iii) the face of the second housing portion adjacent the other axial end face of the rotor has a number of recesses therein equal to N,

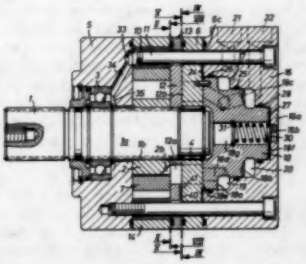
(iv) each of said recesses facing and opening into a respective fluid pocket and extending radially therefrom, said recesses cooperating with portions of the adjacent end face of said rotor to form fluid passages for directing fluid to and from the pockets and

(v) said recesses also having portions which cooperate with said circular array of openings in said other axial end face of the rotor to valve flow as the rotor rotates and orbits, the valved flow being directed to and from the pockets by said fluid passages.

4,411,607
INTERNAL GEAR MACHINE WITH ROTARY PRESSURE BALANCED VALVE DISC

Peter Wiisthof, and Johann Schneider, both of Lohr, Fed. Rep. of Germany, assignors to G. L. Rexroth GmbH, Lohr, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 84,114, Oct. 12, 1979, abandoned. This application Apr. 15, 1981, Ser. No. 254,385
Claims priority, application Fed. Rep. of Germany, Apr. 23, 1980, 3015551
Int. Cl.³ F04C 2/113, 15/00
U.S. Cl. 418—61 B 5 Claims



1. An internal gear hydraulic machine, comprising a housing defining an intake port and a discharge port; a rotary shaft in said housing; a fluid displacement unit arranged in said housing and including an outer gear supported on said shaft for rotation about a central axis thereof; an inner gear in sliding engagement with said outer gear and supported for performing a wobbling movement in said housing about said central axis; said inner and outer gear defining a plurality of variable chambers therebetween; a flow control means including a rotary disc arranged in said housing and mounted on said shaft for rotation at the same speed as said outer gear and one side of said disc forming a lateral boundary wall for said chambers, said rotary disc having a plurality of first openings communicating with the interstices between the teeth of said outer gear

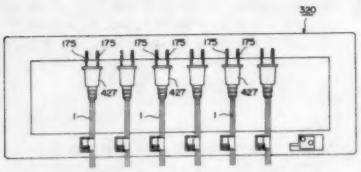
and having control edges at the other side thereof remote from said outer gear; a stationary control plate adjoining said other side of the disc and being provided with a plurality of second openings cooperating with said control edges of the first openings, a part of said second openings communicating with said intake port and another part of said second openings communicating with said discharge port; and a plurality of arcuate recessed sections formed in the interface between said rotary disc and said control plate, said arcuate recessed sections communicating with respective first openings to compensate for tilting moments acting on said rotary disc from said variable chambers.

4,411,608

AUTOMATIC APPARATUS FOR TRANSFERRING ELECTRICAL CORDS WITH TERMINAL BLADES AND FOR THE TESTING THEREOF

Zensuke Yanagisawa, Tokyo, Japan, assignor to Kawasaki Electric Wire Co., Ltd., Kanagawa, Japan

Filed Jun. 16, 1981, Ser. No. 274,223
Int. Cl.³ H01R *43/00*
U.S. Cl. 425—123 **12 Claims**



1. An apparatus for performing an operation on a plurality of electric cords with a pair of terminal blades attached to each cord, said apparatus comprising:

(a) a plurality of carriers for receiving a plurality of electric cords with a pair of terminal blades attached to each cord, each of said carriers comprising a frame member having first and second sides opposed to each other, and said first side having a plurality of pairs of recesses therein, each of said pair of recesses for receiving a pair of said terminal blades and first securing means for securing said terminal blades in said recesses, and said second side having a plurality of cord inserting grooves, each of said grooves for receiving one of said cords therein and cord chuck means for retaining said cords in said grooves, wherein said cord chuck means are automatically operated;

(b) a first side conveyor means having a first position thereon for loading said carriers with said plurality of electric cords with said terminal blades, a second position for placing said plurality of electric cords with said terminal blades into an injection molding device for forming a casing around the end portion of each said cord and said terminal blades, a third position for removing said cord and terminal blades in said casing from said carrier and for placing said cord and terminal blades in said casing into an electric inspection apparatus, and a fourth position for receiving said empty carrier;

(c) a second side conveyor means having a first position at one end thereof coinciding with the fourth position of said first side conveyor means and a second position at the other end thereof, said second side conveyor means transferring said empty carrier from said first position thereof to the second position thereof;

(d) a third side conveyor means having a first position at one end thereof coinciding with the second position of said second side conveyor means and a second position at the other end thereof, said third side conveyor means transferring said empty carrier from the first position thereof to the second position thereof; and

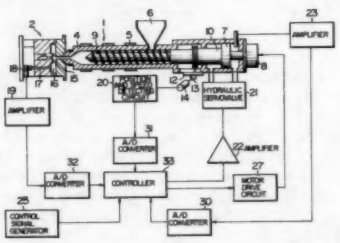
(e) a fourth side conveyor means having a first position at one end thereof coinciding with the second position of said third side conveyor means and a second position at the other end thereof coinciding with the first position of said first side conveyor means, said fourth side conveyor means transferring said empty carrier from said first position thereof to the second position thereof for reloading said carrier with an additional plurality of electric cords with a pair of terminal blades, wherein said first, second, third and fourth side conveyor means are driven independently and are positioned with respect to one another to form a rectangle.

4,411,609

APPARATUS FOR MOLDING PLASTIC

Masaki Yoshii; Hidemi Sato; Aizo Kaneda, all of Yokohama; Masayoshi Aoki, Kamakura; Hitoshi Yokono, Yokohama, and Mitsunori Oka, Hadano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 17, 1981, Ser. No. 255,102
Claims priority, application Japan, Apr. 18, 1980, 55-50406
Int. Cl.³ B29C *1/06*
U.S. Cl. 425—149 **10 Claims**



3. Apparatus for molding a plastic, comprising:

an injection mold having a mold cavity;

a pressure sensor for sensing the pressure of plastic injected into the mold cavity to generate a cavity internal pressure signal;

inflection point detecting means for differentiating the cavity internal pressure signal from said pressure sensor by means of a differentiation circuit, to detect an inflection point corresponding to a gate sealing point of the plastic in the mold cavity; and

means for removing a holding pressure which is exerted on plastic in the mold cavity, said holding pressure being removed when the inflection point corresponding to the gate sealing point is detected by said inflection point detecting means.

4,411,610

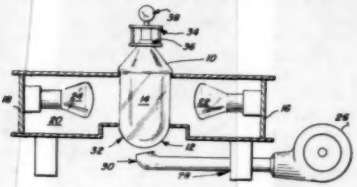
SHRINKAGE REDUCTION OF BLOW MOLDED ORIENTED PET BOTTLE

Wassily Poppe, Lombard; Charles F. Craddock, Glendale Heights, both of Ill.; Robert W. Gutekunst, Dunwoody, Ga.; Robert G. Ladd, Lisle, and Sue A. Mager, Warrenville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 15,308, Feb. 26, 1979, Pat. No. 4,260,567. This application Sep. 18, 1980, Ser. No. 188,319
Int. Cl.³ B29C *25/00*
U.S. Cl. 425—174.4 **3 Claims**

1. Apparatus for heat setting selected portions of a biaxially oriented thermoplastic resin container comprising a container supply line, a container takeoff line, a plurality of infrared lamps arranged in a arcuate manner, shields above and below said lamps to concentrate the output of said lamps to a selected area, a hinged arm, the outer end of which is capable of rotation through the arc defined by said lamps and through a

continuation of said arc to said container takeoff means, a container pickup head on the outer end of said arm adapted to rotate said container as it passes through said arc, a source of gas pressure, a conduit extending from said source of gas pressure through said arm adapted to pressurize said container as it passes through said arc, cooling gas supply conduits adapted to supply gas to the portions of the container not exposed to said infrared radiation.

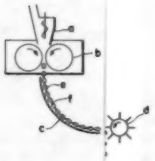


4,411,611

BRIQUETTING MACHINE

Kimiaki Ohtawa, and Yasuo Fukada, both of Hiroshima, Japan, assignors to Mitsubishi Jukogyo kabushiki Kaisha, Tokyo, Japan

Filed Apr. 9, 1981, Ser. No. 252,604
Claims priority, application Japan, May 16, 1980, 55-64091
Int. Cl.³ B29C *25/00*
U.S. Cl. 425—237 **3 Claims**



1. An apparatus for forming briquetes from a pulverized and/or granular material, said apparatus comprising:

feeder means for forcibly feeding puverized and/or granular material;

briquetting means for receiving said material from said feeder means, for compressing and shaping said material into a continuous briquette strip, and for discharging said strip in a direction, said briquetting means comprising a first pair of rolls positioned to recive therebetween said material, said first pair of rolls being rotatable to compress and shape said material and to discharge said strip in said direction;

notching means, positioned downstream of said first pair of rolls with respect to said direction for receiving said strip from said first pair of rolls, for forming in said strip reduced thickness notches extending parallel to said direction and transverse to said direcion, thus defining briquette portions spaced longitudinally and transversely by integral webs at said notches, for further compressing and shaping said briquette portions, and for discharging the thus formed notched strip in said direction, said notching means comprising a second pair of rolls rotatable in synchronization with said first pair of rolls, said second pair of rolls being positioned to recive therebetween said strip, each said roll of said second pair having a cylindrical periphery having extending outwardly therefrom circumferential and axial blades cooperable to form said notches;

guide means, positioned downstream of said second pair of rolls with respect to said direction, for guiding said notched strip discharged from said second pair of rolls; and

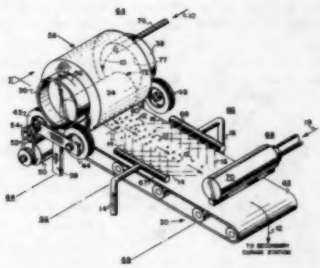
divider means, positioned downstream of said guide means with respect to said direction, for separating said briquette portions by fracturing said webs along said notches, said dividing means comprising a divider roll having extending therefrom a plurality of divider blades, said divider roll being rotatable in synchronization with said first and second pairs of rolls and being positioned such that said divider blades impact with said notched strip upon discharge thereof from said guide means.

4,411,612

APPARATUS FOR RECOVERING PRECIOUS METALS FROM THEIR ORES

Larry D. Holland, Dallas, Tex., assignor to NEHA International, Dallas, Tex.

Division of Ser. No. 254,888, Apr. 16, 1981, Pat. No. 4,374,097.
This application Dec. 14, 1981, Ser. No. 330,133
Int. Cl.³ A01J *21/00*; B29F *5/00*; A23G *1/20*; B29D *7/00*
U.S. Cl. 425—365 **4 Claims**



1. Apparatus for processing a paste of ore and binder material comprising:

a conveyor assembly;

an extruder drum supported for rotation above said conveyor assembly at an extruding station, said extruder drum having a chamber for receiving the paste material and having a perforated cylindrical sidewall enclosing said chamber;

a free wheeling cylindrical roller received within said drum for forcing the paste material through the drum sidewall perforations and depositing the paste in the form of pellets onto the conveyor assembly in response to rotation of said drum;

drive means coupled to said drum for rotating said drum;

a spray bar disposed adjacent said conveyor assembly at a spraying station for spraying a lixiviant solution onto pellets transported by said conveyor assembly from the extruding station to the spraying station; and

a dryer assembly disposed adjacent said conveyor assembly at a drying station for drying the lixiviant coated pellets as they are transported by the conveyor assembly from the spraying station.

4,411,613
APPARATUS FOR THE VACUUM CALIBRATION OF PROFILED ARTICLES MADE OF A THERMOPLASTIC SYNTHETIC RESIN

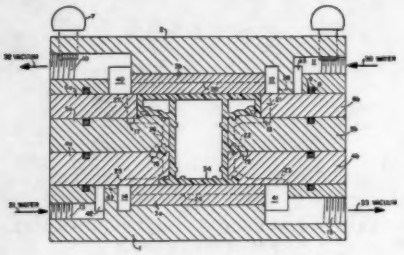
Peter Gauchel, Eitorf-Alzenbach, and Josef Kurth, Troisdorf, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Division of Ser. No. 16,171, Feb. 28, 1979. This application Jun. 11, 1981, Ser. No. 272,575

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1978, 2809386

Int. Cl.³ B29C *17/00*; B29D *23/00*

U.S. Cl. 425—388 **6 Claims**



1. An apparatus for effecting liquid cooling and calibration of a longitudinal section of a profiled article of thermoplastic synthetic resin which comprises a calibrating tool for applying a vacuum externally to the entire periphery of a longiudinal section of the profiled article, said tool being formed of a plurality of plate-like members that extend parallel to each other and that have internal calibration walls defining an aperture for calibrating the profiled article in contact with said calibrating walls; said members having vacuum slots within said walls that extend at right angles to the longitudinal direction of the tool and that adjoin the entire periphery of the profile surface of a longitudinal section of the profiled article; means for applying a vacuum to said slots; and means for feeding liquid coolant through said calibration members including at least one duct in communication with said vacuum slots whereby said liquid coolant is caused to flow transversely along the profile surface to which vacuum is applied and is discharged from the calibrating tool via said means for applying said vacuum.

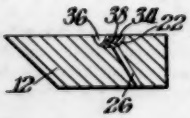
4,411,614
REMOVABLE CONTOURED INSERT FOR AN EXTRUSION DIE

William D. Feathers, Towanda, Pa., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Feb. 18, 1982, Ser. No. 349,988

Int. Cl.³ B29F *3/04*

U.S. Cl. 425—466 **6 Claims**



1. In an extrusion die of the type having a flow distribution channel with a boundary defining a forward edge of an essential land, the channel exhibiting a first predetermined shape and having an inlet passage communicating therewith, the improvement which comprises:

an insert shaped for insertion into a close-fitting relationship with the flow distribution channel, the insert being sized so as to partially fill the flow distribution channel when received therein to define a second flow distribution channel having a second predetermined shape with the boundary of the second flow distribution channel maintaining the same forward edge on the die, the insert having an opening communicating with both the second flow distribution channel and with the inlet passage.

2. In an extrusion die of the type having a receptacle of standardized geometry formed therein, one boundary of the receptacle defining a forward edge of an essential land, an inlet passage for introducing a coating material, the improvement which comprises:

an insert shaped for insertion into a close-fitting relationship with the receptacle, the insert partially filling the receptacle and cooperating with the boundary defining the forward edge of the essential land to define a distribution channel having a predetermined shape, the insert having an opening communicating with both the distribution channel and with the inlet passage.

4,411,615
INJECTION MOULDING MACHINE

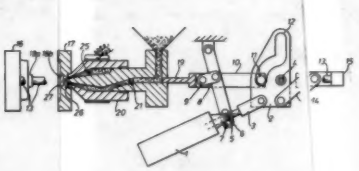
Richard A. Butler, Stourbridge, England, assignor to Mining & Chemical Products Limited, Middlesex, England

Filed Apr. 9, 1981, Ser. No. 252,435

Claims priority, application United Kingdom, Apr. 9, 1980, 8011789

Int. Cl.³ B29F *1/06*

U.S. Cl. 425—59 **9 Claims**



1. A machine for automatically producing a succession of small components by injection moulding, comprising: a mould operable between open and closed positions by a first transmission element, and an injection unit operable by a second transmission element, said transmission elements being individually reciprocable along the longitudinal axis of the machine by a common actuating device and interconnected by means operable in response to operation of said actuating device to prevent operation of said injection unit until said mould has been closed, said interconnecting means comprising a plate connected by a toggle link to said first transmission element and formed with a cam slot which receives a cam follower on said second transmission element and is so shaped as to first permit said plate to be pivoted about its axis by said actuator to a sufficient extent to close said mould through said first transmission element and then to restrain further pivotal movement of said plate while said cam follower moves, relatively thereto, along said slot in a direction to operate said injection unit.

4. A machine for automatically producing a succession of small components by injection moulding, comprising: a mould operable between open and closed positions by a first transmission element, and an injection unit operable by a second transmission element, said transmission elements being individually reciprocable along the longitudinal axis of the machine by a common actuating device which operates in a straight line making an acute angle with the longitudinal axis of the machine and has separate connections to said transmission elements, both said connections including a member pivotable about an axis extending at right angles to the longitudinal axis of the machine and a part of one of said connections also forming a part of means which interconnect said transmission elements and is operable in response to operation of said actuating device to prevent operation of said injection unit until said mould has been closed, said interconnecting means comprising

a plate connected by a toggle link to said first transmission element and formed with a cam slot which receives a cam follower on said second transmission element and is so shaped as to first permit said plate to be pivoted about its axis by said actuator to a sufficient extent to close said mould through said first transmission element and then to restrain further pivotal movement of said plate while said cam follower moves, relatively thereto, along said slot in a direction to operate said injection unit.

4,411,616

APPARATUS FOR BURNING OF FUEL GASES AND PROCESS FOR AVOIDANCE OF COMBUSTION CHAMBER OSCILLATIONS

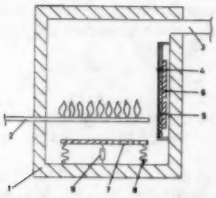
Ernst-Georg Neumann, Wuppertal, Fed. Rep. of Germany, assignor to Didier-Werke AG, Wiesbaden, Fed. Rep. of Germany

Filed Nov. 27, 1979, Ser. No. 97,797

Claims priority, application Fed. Rep. of Germany, Nov. 27, 1978, 2851248

Int. Cl.³ F23D *15/04*

U.S. Cl. 431—114 **8 Claims**



1. In a device for the combustion of fuel gases and liquid, powdered or particulate fuels, comprising a combustion chamber, means for delivering a fuel-air mixture to said combustion chamber for combustion of said fuel therein, and an outlet for the burned gases, the improvement for avoiding sonic and and subsonic oscillation of gases in the combustion chamber which consists in that said combustion chamber comprises a casing having a rigid walls, and that an oscillation plate spaced inwardly of a wall of said casing with its peripheral edge hermetically connected to the casing wall is oscillatable by oscillations occurring in said combustion chamber, and means associated with said plate is provided for damping oscillation of said oscillatable plate.

4,411,617

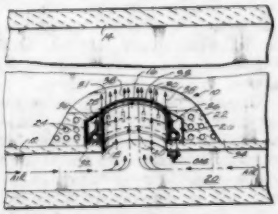
BURNERS FOR SOAKING PIT FURNACES

John Maksim, Jr., 8165 Cornwall Ave., Etiwanda, Calif. 91739

Continuation of Ser. No. 146,469, May 5, 1980, abandoned, which is a continuation of Ser. No. 850,235, Nov. 10, 1977, abandoned. This application Aug. 17, 1981, Ser. No. 293,387

Int. Cl.³ F23C *7/00*

U.S. Cl. 431—187 **21 Claims**



1. A soaking pit comprising:

a furnace having a floor and an enclosed area above a floor for containing metal ingots to be heated;

an air supply pipe having an upper end spaced above the furnace floor;

an exterior housing surrounding the side wall of the air supply pipe and spaced laterally from the air supply pipe to form an annular hollow interior region between the air supply pipe and the housing, the housing having an upper exterior wall spaced above the furnace floor and defining the top of the burner, said upper exterior wall of the housing being spaced closely apart from the upper end of the air supply pipe to form a narrow annular burner opening atop the burner above said hollow interior region, the burner opening being spaced above the furnace floor at substantially the same elevation as the upper end of the air supply pipe and the upper exterior wall of the housing;

means for supplying air in the substantial absence of fuel to the air supply pipe for causing such air to flow through the pipe and upwardly past the burner opening; and

gas supply means for supplying gaseous fuel to said hollow interior region for causing such fuel to flow through said burner opening and into the furnace above the upper end of the air supply pipe and above the upper exterior wall of the housing so that the fuel mixes with the air flowing past said burner opening to form a combustible fuel/air mixture which, when ignited, produces a flame adjacent the upper exterior wall of the housing and the upper end of the air supply pipe.

4,411,618

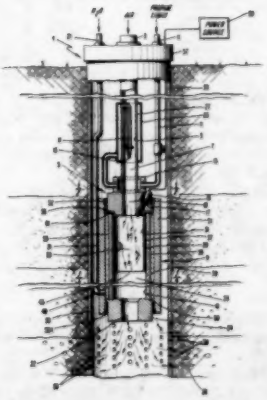
DOWNHOLE STEAM GENERATOR WITH IMPROVED PREHEATING/COOLING FEATURES

A. Burl Donaldson; Donald E. Hoke, both of Albuquerque, and Anthony J. Mulac, Tijeras, all of N. Mex., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Oct. 10, 1980, Ser. No. 195,966

Int. Cl.³ F23L *7/00;* **E21B** *43/00*

U.S. Cl. 431—190 **3 Claims**



3. An apparatus for downhole steam generation comprising:

a combustor assembly having a fuel/oxidant mixing section and a combustor unit;

an oxidant supply means connected to said fuel/oxidant mixing section;

a fuel supply means connected to said fuel/oxidant mixing section;

an ignitor means connected with said combustor unit;

a water supply means connected to said combustor unit for providing water to be converted to steam by the heat of combustion of the fuel/oxidant;

said combustor unit including an inner combustor sleeve having an inner wall defining a combustion zone;

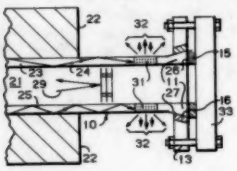
an intermediate sleeve spaced concentrically with respect to said inner combustor sleeve, the space between said intermediate sleeve and said inner combustor sleeve connected to said water supply means and defining an annular water flow channel for said inner combustor means, said intermediate sleeve having a portion extending below said inner sleeve, said extending portion having an inner wall defining a steam generating zone; and

a water ejector means for controlling the flow of water through the annular water flow channel and comprising an annular spray injector member positioned between the lower end of the inner combustor sleeve and the intermediate sleeve said annular spray injector member comprising a plurality of spaced apertures around the outer periphery of said annular spray injector member adjacent the intermediate sleeve for ejecting said water downwardly along the inner wall of said intermediate sleeve, said annular spray injector member being capable of restricting the flow of water therethrough to ensure the continuous and even distribution of water throughout said water flow channel.

4,411,619
FLANGE AND COUPLING COOLING MEANS AND METHOD

Robert D. Darnell, Phoenix; Carl A. Goetz, Scottsdale, and William M. Ingle, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 2, 1981, Ser. No. 250,494
Int. Cl.³ F27D *7/00, 5/00, 1/12*; F27B *14/10*
U.S. Cl. 432—1 **15 Claims**



15. A method for protecting a closure means for a thermal radiation carrying member composed of a predetermined material, from radiation being carried by said member within said material from a portion of said member exposed to a thermal radiation source, comprising:

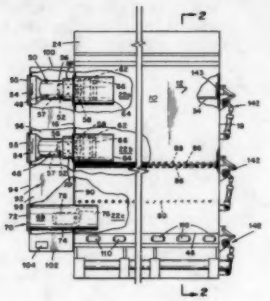
installing serially in said material of said member a thermal radiation scattering zone between said source and said closure means so as to reduce the thermal radiation reaching said closure means.

4,411,620
GRAIN DRIER AND METHOD OF DRYING GRAIN

Robert D. Applegate, Attica, Ind., assignor to Driall, Inc., Attica, Ind.

Filed Sep. 29, 1981, Ser. No. 306,666
Int. Cl.³ F24H *1/00*; F27B *9/04*; F26B *17/12*
U.S. Cl. 432—29 **4 Claims**

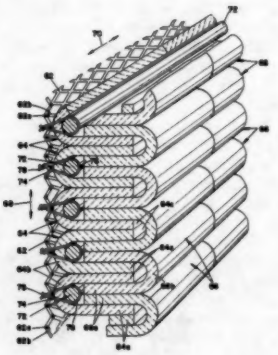
1. Apparatus for heating air for drying grain which air includes air which has been passed through grain comprising, a generally cylindrical duct, a propeller type fan having a larger diameter than the diameter of said duct, mounted at one end of said duct for moving ambient air through said duct from its other end, a cylindrical housing for said fan, said housing having a diameter larger than said inlet duct to accommodate said fan, said housing and said inlet duct being aligned in end-to-end relation, an open flame type burner in said housing, said burner being centrally located in said housing and positioned downstream of said fan, said burner being proportioned to provide a peripheral space between said burner and said housing, a plurality of stationary vanes in said housing intermediate said propeller type fan and said burner, said vanes being positioned to cause air currents generated by said fan to move axially through said housing, and means for conducting air which has passed through grain into the space between said inlet duct and said housing.



4,411,621
FURNACE WALL CONSTRUCTION

Thomas M. Miller, 26027 Byron Dr., North Olmsted, Ohio 44070

Continuation-in-part of Ser. No. 213,557, Dec. 5, 1980, abandoned. This application Nov. 16, 1981, Ser. No. 320,861
Int. Cl.³ F27D *1/00*; F23M *5/00*
U.S. Cl. 432—247 **24 Claims**



1. A wall construction for a heating chamber comprising, open metal mesh means providing an exposed outer wall surface for said heating chamber and having outer and inner sides said metal mesh means having pairs of parallel spaced apart edges, mat means of fibrous insulating material covering said inner side of said metal mesh means between said pairs of edges, said mat means including U-shaped sections having parallel legs and an integral bridging portion therebetween, said bridging portions facing said inner side of said metal mesh means and said legs extending inwardly from said inner side of said metal mesh means and between one of said pairs of edges thereof in parallel relationship with respect to one another, support rod means extending between said one pair of edges of said metal mesh means and between the legs of said U-shaped sections adjacent said bridging portion therebetween, and a plurality of fastener elements spaced apart along said support rod means and connecting said support rod means to said metal

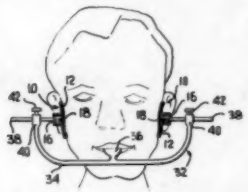
mesh means, each said fastener element having an inner end extending around said support rod means and an outer end interengaged with said metal mesh means.

4,411,622

JAW HINGE-AXIS LOCATOR

Gorm P. Hansen, 1501 SE. 23rd Ave., Pompano Beach, Fla. 33062

Filed Oct. 9, 1981, Ser. No. 310,413
Int. Cl.³ A61C *19/04*
U.S. Cl. 433—73 **9 Claims**



1. A device for securing a dental face-bow of the type having hinge pointers to the face of a dental patient with the hinge pointers of the face-bow in axial alignment with the patient's jaw hinge-axis, said device comprising in combination:

a base member adapted to be adhesively secured to a patient's face over a jaw hinge condyle;

means disposed on said base member for receivingly locating a hinge pointer of a face-bow therewithin in axial alignment with a patient's jaw hinge axis; and

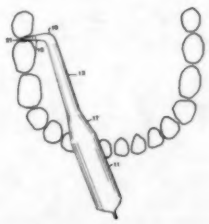
said base member being a generally pliable and planar card having an adhesive disposed on one surface thereof.

4,411,623

DEVICE FOR APPLYING TOOTHPASTE

Per A. T. Axelsson, Drottninggatan 27, S-652 25 Karlstad, Sweden

Filed Oct. 21, 1981, Ser. No. 313,489
Claims priority, application Sweden, Oct. 31, 1980, 8007683
Int. Cl.³ A61G *17/02*
U.S. Cl. 433—80 **4 Claims**



1. A non-refillable applicator device for the application of toothpaste directly upon teeth for cleaning, polishing, or similar surface treatment thereof, comprising: an integrally formed tubular body of plastics material having a handle portion shaped and dimensioned so as to be capable of being grasped by two or more fingers of the hand and also defining interior space means and constituting a container of paste, said handle portion having a non-circular cross-section over the greater part of its length and the wall of said handle portion being thinner along the broad sides than along the narrower sides thereof; a conduit portion extending from said handle portion substantially in the direction of the length of the handle portion and being of tapering cross-section considerably less than the cross-section of said handle portion and of a length approximately corresponding to the distance between the incisors and the back molars of a human; a pointed nozzle portion forming outlet means for paste; a bent portion interconnecting said pointed nozzle portion and said conduit portion so that said nozzle portion is directed at an angle to the direction of extension of said conduit portion; the walls defining the conduit and nozzle portions of the tubular plastics body being comparatively thick in order to provide stiffness thereof, and the wall of the handle portion being comparatively thin in order to enable such to be compressed to permit paste to be expelled; and said nozzle portion having a triangular cross-section gradually decreasing in cross-section from said bent portion to an end thereof for outlet of paste.

4,411,624

DENTAL IMPLANT

Makoto Ogino, Yokohama; Takamitsu Fujiu, Tokyo; Michio Kariya, Yokohama, and Takeo Ichimura, Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Oct. 7, 1981, Ser. No. 309,513
Claims priority, application Japan, Oct. 29, 1980, 55-151964
Int. Cl.³ A61C *8/00*
U.S. Cl. 433—173 **1 Claim**

1. A dental implant comprising a dental root part to be embedded in a jaw bone alone or in combination with a dental crown or a dental crown supporting part, which dental implant is characterized in that at least a substantial portion of the dental root surface to be placed in contact with the jaw bone is formed of a biologically active glass or glass-ceramic material and the contour of said dental root part is rotationally symmetrical with its diameter being monotonously decreased from one end forming the collum dentis portion of the dental root to the other end forming the root end portion which is in the form of a semi-sphere, approximately, and said dental root part is so designed as to satisfy the condition:

$$0.42 < r/r_0 < 1.0;$$

wherein, r is the radius of curvature of said root end portion; and

r_0 is the radius of said collum dentis portion of said dental root part.

4,411,625

BROAD SPECTRUM LIGHT CURABLE DENTAL COMPOSITIONS

Franics F. Koblitz, York, and Jane L. Reichart, Hanover, both of Pa., assignors to Dentsply Research & Development Corp., Milford, Del.

Continuation of Ser. No. 182,624, Aug. 29, 1980, abandoned. This application Jun. 10, 1982, Ser. No. 386,897
Int. Cl.³ A61K *6/08*
U.S. Cl. 433—217 **3 Claims**

1. A process for repairing teeth comprising applying to a prepared tooth a dental restorative composition curable by irradiation by visible and/or ultraviolet light comprising

a major proportion of an inorganic filler, and

a minor proportion of a resin component comprising:

a binder resin, comprising bis-GMA reacted wtih aliphatic diisocyanate,

a polymerizable acrylic diluent monomer, and

a photosensitizing system comprising from about 0.05% to

about 0.30% by weight of the restorative of an aliphatic alpha diketone,

from about 0.2% to about 1.0% by weight of the restorative of an amine reducing agent, and

from about 0.1% to about 1.0% by weight of the restorative of a benzoin alkyl ether,

said photosensitizing system being present in an amount sufficient to cause substantial polymerization of said composition upon irradiation with visible and/or ultraviolet light,

said composition retaining good color stability, and exposing said composition to visible and/or ultraviolet light for a time sufficient to cause substantial polymerization of said composition.

4,411,626

PROCESS AND APPARATUS FOR PREPARING A CROWN PORTION TO BE FIXED ON A TOOTH

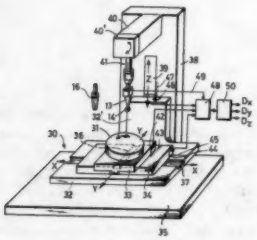
Günter Becker, Aachen, and Horst Weiden, Stolberg, both of Fed. Rep. of Germany, assignors to Becker Dental-Labor GmbH, Aachen, Fed. Rep. of Germany

Filed Jan. 9, 1981, Ser. No. 223,685

Claims priority, application Fed. Rep. of Germany, Jan. 31, 1980, 3003435

Int. Cl.³ A61C *5/10*

U.S. Cl. 433—223 **10 Claims**



1. In a process for preparing a dental crown portion to be secured to a tooth stump in which a model is made of the tooth stump, molding material is applied to the model and has its outer contour formed by removal of material, said molding material being thereafter removed from the model and used as a casting model for the dental crown portion, the steps of:

scanning with a scanning head for conversion into geometrical data at least part of the contour of the tooth stump;

supplying the geometrical data to a computer memory coupled to the scanning head;

calculating, from the geometrical data, the contour for the casting model, taking into account an allowance for material on the outer surface of the tooth stump and storing said data in the computer memory; and,

guiding, according to the calculated contour for the casting model, a contour tool coupled to the computer memory along the molding material that has been applied to the model of the tooth stump whereby a casting model for a dental crown portion is formed.

4,411,627

ARTICULATED LIGHT GUIDE

Denis R. Breglia, Altamonte Springs; Frank J. Oharek, Maitland, and Paul D. Grimmer, Winter Park, all of Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

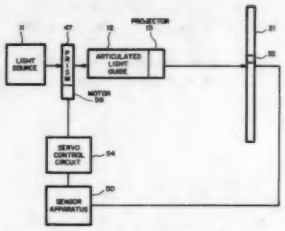
Filed Jan. 28, 1982, Ser. No. 343,682

Int. Cl.³ G09B *9/08*

U.S. Cl. 434—44 **6 Claims**

1. An improved articulated light guide system for transmitting a plurality of computer generated scan lines onto a screen from a helmet mounted projector in a predetermined orientation, comprising:

means for communicating light from said helmet mounted projector to said screen;



means for sensing the orientation of said light at said screen and outputting a corresponding signal;

means for adjusting the orientation of said light in accordance with a signal received from said sensing means.

4,411,628

ELECTRONIC LEARNING AID WITH PICTURE BOOK

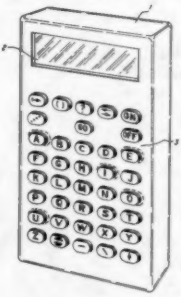
Thomas C. Laughon, and Michael I. Philpott, both of Lubbock, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 44,437, Jun. 1, 1979, Pat. No. 4,308,017. This application Sep. 11, 1981, Ser. No. 301,250

The portion of the term of this patent subsequent to Dec. 29, 1998, has been disclaimed.

Int. Cl.³ G09B *7/02*

U.S. Cl. 434—169 **8 Claims**



1. A learning aid system for teaching and testing associations between pictorial representations and correct responses to said pictorial representations, said system comprising:

a plurality of pictorial representations to which operator responses are desired, each of said pictorial representations having an intended appropriate operator response different from the others;

means for identifying one of said plurality of pictorial representations to which an operator response is desired;

memory means independent of said plurality of pictorial representations and storing respective correct responses associated with each of said pictorial representations;

operator input means for receiving an input from an operator of the learning aid system as a proposed response to the selected one of said plurality of pictorial representations;

comparator means operably associated with said operator input means and said memory means for comparing the input received by said operator input means from the operator with the correct response stored in said memory

means for said selected one of said plurality of pictorial representations and for providing an output indicative of the comparison therebetween; and

presentation means responsive to the output of said comparator means for producing a presentation for comprehension by the operator indicative of the appropriateness of the input received by said operator input means with respect to said selected one of said plurality of pictorial representations.

4,411,629

PALPATION AND AUSCULTATION TEACHING METHOD AND APPARATUS

Dora L. Voights, 737 S. 6th Ave., La Grange, Ill. 60525

Filed Mar. 17, 1982, Ser. No. 359,146

Int. Cl.³ G09B *23/34*

U.S. Cl. 434—266 **1 Claim**

1. Apparatus for teaching palpation and auscultation of a fetus in a pregnant female utilizing a female model, comprising:

a fetal doll;

means for simulating fetal heart tones attached to said fetal doll;

a cushion having an opening in which said fetal doll is inserted;

filling material packed into said cushion, surrounding said fetal doll;

an outer cover for said cushion;

a strap attached to said cover for strapping said cover containing said cushion to the female model; and

said outer cover having an opening in which said cushion is removably inserted, said cushion being adjustably movable within said cover for varying the position of said fetal doll relative to the female model to simulate different real-life fetal positions.

4,411,630

WATER-JET DRIVE MECHANISM FOR THE DRIVING OF WATERCRAFT

Franz Krautkremer, and Siegfried Lais, both of Spay, Fed. Rep. of Germany, assignors to Schottel-Werft, Josef Becker GmbH & Co KG., Spay, Fed. Rep. of Germany

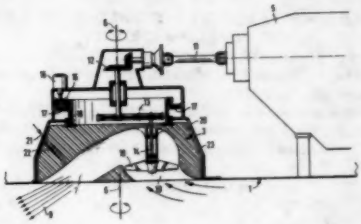
Filed Feb. 13, 1981, Ser. No. 234,125

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1980, 3009671

Int. Cl.³ B63H *11/02*

U.S. Cl. 440—42 **5 Claims**

1. A water-jet drive mechanism for propelling a watercraft having a hull on a body of water, comprising a suction passage communicating with said body of water; a downwardly inclined ejector passage communicating with said body of water; pump means communicating with said suction passage and said ejector passage for drawing water in through said suction passage and ejecting it in a downwardly inclined direction through said downwardly inclined ejector passage as a water jet; means for ensuring said water jet continues in said downwardly inclined direction after leaving said ejector passage, including means for supplying a gas to the water flowing through said ejector passage; housing means defining a recess in said hull; an elbow supported in said recess, said suction passage and said ejector passage being provided in said elbow; said means for supplying said gas including a gas inlet through said housing means and a gas passageway in said elbow which communicates with said gas inlet and with said ejector passage and conveys a gas to said ejector passage from said gas inlet in



said housing means; said elbow being pivotally supported within said recess for movement about a generally vertical axis; said housing means being separated from said pivotable elbow by an annular space, said gas inlet through said housing means opening into said annular space, said gas passageway through said elbow providing communication from said annular space to said ejector passage; and said housing means and said elbow having cooperating sealing means.

4,411,631

PROPELLER GUARD

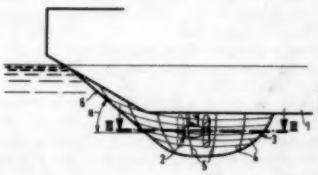
Eero Mäkinen, Espoo, and Stefan Gordin, Helsinki, both of Finland, assignors to Oy Wartsila Ab, Helsinki, Finland

Continuation of Ser. No. 79,715, Sep. 28, 1979, abandoned. This application Sep. 8, 1981, Ser. No. 300,201

Claims priority, application Finland, Sep. 29, 1978, 782966

Int. Cl.³ B63H *5/16*

U.S. Cl. 440—72 **14 Claims**



1. An ice guard surrounding the propeller of a vessel, in particular a ferry intended for traffic in ice-filled waters, having a propeller mechanism with at least one propeller unit positioned in the front part of said vessel for propulsion, comprising:

a rigid grid unit with a general outer form free of discontinuous portions and arranged completely to enclose said at least one propeller unit,

said grid unit being attached to and supported by a, at least in the transverse direction of the vessel, substantially horizontal bottom surface of the vessel,

the width of said grid unit at its upper edge at said bottom surface of the vessel, being at least 80 percent of the greatest width of the grid unit and the length of said grid unit being a small part of the length of said vessel,

said grid unit having, at the end thereof closer to said front part of said vessel, an oblique front portion, which at least substantially all over, in a central longitudinal section of the grid, is inclined relative to a horizontal plane at an angle of at the most 50°, and

said grid unit having a plurality of substantially horizontal

constructional grid-forming elements, said elements forming an angle with said oblique front portion, and having, close to said front portion an obliquely downwardly directed position corresponding to the gliding direction of ice blocks passing said ice guard when said vessel is moving through ice-filled waters.

4,411,632

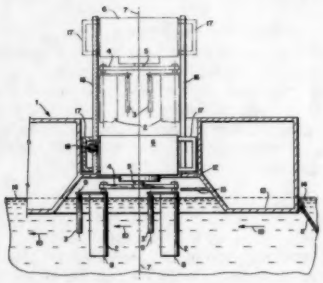
WATERBOUND FACILITY POWERED BY CYCLOIDAL FLUID FLOW ENGINES

Hans F. Wuenscher, deceased, late of Huntsville, Ala., by Hertha A. Wuenscher, administratrix, 2004 Dogwood La., Huntsville, Ala. 35810

Continuation-in-part of Ser. No. 919,811, Jun. 28, 1978, abandoned, which is a continuation of Ser. No. 777,532, Mar. 14, 1977, abandoned. This application May 26, 1981, Ser. No. 266,848

Int. Cl.³ B63H 5/00

U.S. Cl. 440—93 **5 Claims**



1. A waterbound facility comprising:

a floating facility having its production machinery powered by cycloidal fluid flow engines with impeller blade assemblies of aerodynamic wing and tail configuration, wherein each said cycloidal fluid flow engine comprises:

a vertical mainshaft having disclike radial structure extending from its lower end;

a number of impeller blade assemblies,

each assembly being mounted at equal peripheral spacing to said radial structure,

each blade assembly rotatable freely about its axis, and

each assembly being composed of a wing and a tail, and

each assembly having the axis of rotation parallel to said mainshaft and extending downward from said radial structure, and

each assembly having a tail surface reciprocating once during each revolution of said mainshaft effecting pitch control for said blade assemblies, and

control means effecting said tail surface reciprocation as a function of the relative rotational position between said radial structure and said blade assemblies;

means for mooring said facility in a water current;

means for transmitting the shaft power of said engines to said machinery.

4,411,633

METHOD FOR FORMING ELECTRICAL CONTACTS BETWEEN A CONDUCTOR-CARRYING CABLE AND A DISPLAY CELL

Wesley K. Waldron, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 161,214, Jun. 19, 1980, Pat. No. 4,386,293. This application Oct. 18, 1982, Ser. No. 434,977

Int. Cl.³ H01J 9/36

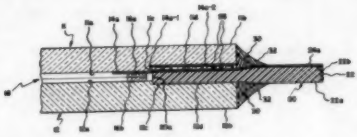
U.S. Cl. 445—24 **3 Claims**

1. A method for forming contacts between at least one electrode fabricated upon the interior surface of at least one of a pair of substrates forming the front and rear surfaces of a display cell, and conductors disposed upon at least one surface of a cable, comprising the steps of:

providing said substrates with a gap of predetermined distance therebetween when said substrates are placed in facing relationship;

providing a cable-abutting portion on the interior surface of each of the substrates adjacent to an end thereof to form opposed surfaces of said gap;

fabricating at least one conductive lead portion upon at least one of the cable-abutting portion interior surfaces and each integrally joined to an associated one of said electrodes;



arranging each of the conductive lead portions to be in registration within an associated conductor of the cable when the cable surfaces are positioned with said gap and adjacent to the cable-abutting portions of that substrate having the associated conductive lead portions thereon;

placing the cable within the gap between the interior-facing surfaces of the cable-abutting substrate portions and with the conductive lead portions and associated cable conductor portions in registration each to the other; and

forming a conductive bond between each of the registered conductive lead portions and the associated cable conductor.

4,411,634

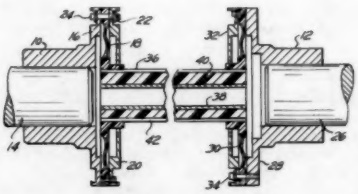
FLEXIBLE COUPLING HAVING MOLDED PLASTIC FLEXIBLE DIAPHRAGMS

Robert W. Hammelmann, Minoa, N.Y., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Nov. 10, 1980, Ser. No. 205,360

Int. Cl.³ F16D 3/78

U.S. Cl. 464—91 **16 Claims**



1. A flexible mechanical coupling comprising:

a first member having an axis of rotation, a flange extending radially from said axis of rotation, and means concentric with said axis of rotation for connection with a rotatable shaft;

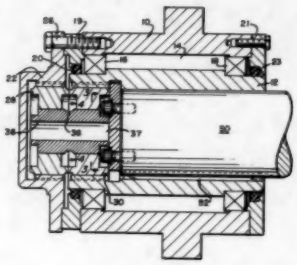
a structural plastic shaft having a convoluted external surface and an internal metal sleeve; and

a first structural plastic flexible diaphragm interconnecting one end of said shaft to said first member, said flexible diaphragm having a peripheral rim fixedly attached to said radial flange, a hub having a convoluted bore shrunk fit onto the convoluted external surface of said shaft, and a flexible section intermediate said hub and said rim.

4,411,635
SHEAR OVERLOAD RELEASE COUPLING

Howard W. Boothroyd, and Lawrence A. Carlsmith, both of Amherst, N.H., assignors to Ingersoll-Rand Company, Woodcliff Lake, N.J.

Filed Nov. 20, 1980, Ser. No. 208,497
Int. Cl.³ F16D 9/00
U.S. Cl. 464—33 3 Claims



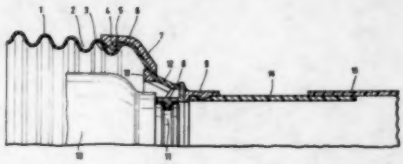
1. In combination: an outer rotatable driving member; a coaxial inner rotatable driven member with an outside diameter less than the inside diameter of the outer rotatable driving member thereby providing an annular space between the outer rotatable driving member and the inner rotatable driven member; roller bearing means in said annular space between the rotatable driving member and the rotatable driven member; interconnecting means interconnecting the rotatable driving member and the rotatable driven member and including a single coaxial frangible member adapted to shear at a predetermined torque, a removable drive cap having a bore with internal splines and connected to the outer rotatable member, a first adapter with external splines engaging the splines on the drive cap, a second adapter with external splines engaging splines on the driven member, each adapter having a central bore, said coaxial frangible member extending through the bores of the adapters, the shape and dimension of the adapter bores and the shape and dimension of the outside of the frangible member being such that the frangible member fits in the bores so that rotation of the outer rotatable driving member imparts rotation to the inner rotatable driven member and whereby the frangible member is sheared if said predetermined torque occurs, the rotatable driven member no longer rotates, the outer rotatable driving member rotates about the inner rotatable driven member on the roller bearing means for a short time after the frangible member is sheared, the removable drive cap may be removed and the sheared frangible member replaced.

4,411,636
PROTECTIVE DEVICE FOR A UNIVERSAL JOINT ASSEMBLY

Theo Buthe, Lohmar, and Felix Mikeska, Siegburg, both of Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Jul. 9, 1981, Ser. No. 281,643
Claims priority, application Fed. Rep. of Germany, Jul. 10, 1980, 3026135
Int. Cl.³ F16P 1/00
U.S. Cl. 464—172 1 Claim

1. A protective device for a universal joint assembly between two shafts connecting an agricultural implement with a tractor, including a pair of telescopic protective tubes surrounding at least one of said shafts, one of said tubes having an annular bearing member at a respective end of said at least one shaft which engages into an annular groove of a shank of said joint assembly, said protective device comprising, in combination, a protective boot having a bellows-like configuration defining circumferential folds and including a conical connecting portion, a connecting piece having said bearing member connected thereto by means of which a respective protective tube is connected with said protective boot, said connecting piece including a funnel-like extension partially projecting into said conical connecting portion of said protective boot, a rigid supporting ring engaging about said protective boot and including a conical part adapted to extend in embracing engagement over said conical connecting portion of said protective

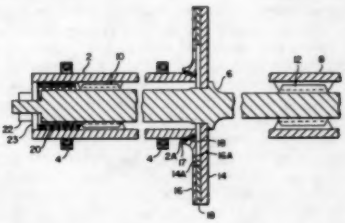


boot, said conical part extending to partially overlap said funnel-like extension, and a bead directed radially inwardly extending from said supporting ring into engagement within one of said folds of said protective boot, said bead being formed on one side thereof with a conical surface to facilitate insertion of said protective boot into said supporting ring and on the opposite side thereof with a hook-like shape for maintaining engagement within said fold.

4,411,637
COMPLIANTLY MOUNTED DAMPING MEANS

Burton S. Rauch, Howell, N.J., assignor to The Bendix Corporation, Teterboro, N.J.

Filed Dec. 17, 1981, Ser. No. 331,502
Int. Cl.³ F16F 15/12
U.S. Cl. 464—180 4 Claims



1. Compliantly mounted damping means for rotating equipment of the type including a rotor shaft and a quill shaft coupling the rotor shaft to a driver shaft, characterized by:

a first plate rigidly mounted to the quill shaft;

a second plate having a conical bore;

the rotor shaft having a conical tip which fits snugly into the conical bore;

means for compliantly mounting the second plate to the rotor shaft including an elastomeric member disposed within the conical bore;

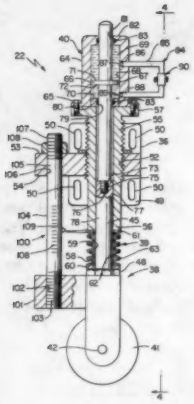
means for providing an axial load, whereby the first and second plates are maintained adjacent each other to provide torsional damping; and

the means for compliantly mounting the second plate to the rotor shaft permitting the second plate to follow the angular displacement of the first plate occurring due to misalignment between the respective shafts.

4,411,638
BELT TENSIONER AND METHOD OF MAKING THE SAME

Leslie B. Wilson, Reeds Spring, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Aug. 27, 1981, Ser. No. 296,695
Int. Cl.³ F16H 7/12
U.S. Cl. 474—138 16 Claims



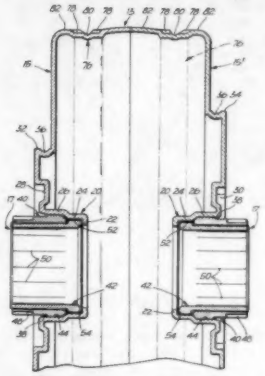
1. In a tensioner for a power transmission belt that is adapted to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt, a belt engaging means carried by said support means and being movable relative thereto, mechanical spring means operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, said mechanical spring means providing the sole force of said tensioner for tensioning said belt, and dampening means to dampen the movement of said belt engaging means relative to said support means with a restricting force of said dampening means, said dampening means comprising fluid dampening means operatively associated with said support means and said belt engaging means to dampen the movement of said belt engaging means relative to said support means in at least one direction of movement thereof, the improvement wherein said dampening means dampens the movement of said belt engaging means with a greater said restricting force when said belt engaging means is being moved in one direction relative to said support means than said restricting force of said dampening means when said belt engaging means is being moved in the opposite direction relative to said support means, said one direction of movement of said belt engaging means relative to said support means that has said greater restricting force imposed thereon by said dampening means being a direction that is opposed to said urging force of said spring means and, thus, being a direction away from said belt.

4,411,639
MULTI-PURPOSE WHEEL PARTICULARLY USEFUL FOR GAMES AND DEMONSTRATIONS

Hubert Rüther, Elbring 25, Seevetal 8 bei Hamburg, Fed. Rep. of Germany D-2105

Filed Dec. 30, 1980, Ser. No. 221,466
Claims priority, application Fed. Rep. of Germany, Feb. 1, 1980, 3003698
Int. Cl.³ A63H 17/26
U.S. Cl. 474—902 17 Claims

1. A wheel comprising a tread, at least a rim provided on an outer side thereof with one half of an axially assemblable claw coupling, a wheel hub including a wheel bushing fixed axially with respect to the rim and fixed for rotation with the rim and including an axle bushing positioned generally within the wheel bushing and fixed axially with respect to the rim and rotatable in a free running manner with respect to the rim, and a hub cap provided with the other half of the axially assemblable claw coupling for axial attachment to said rim and adapted to be connected for rotation with said wheel axle such that



rotation of said wheel axle causes rotation of said hub cap and rotation of said hub cap causes rotation of said rim, and wherein said rim is provided on another side with an axially open, continuous annular groove adapted to be positioned for reception of bosses of said other half of the axially assemblable claw coupling.

4,411,640
APPARATUS FOR THE PRODUCTION OF CIGARETTE FILTER TIPS HAVING MULTI-SECTIONAL CONSTRUCTION

Floyd V. Hall, Durham, N.C., assignor to Liggett Group Inc., Montvale, N.J.

Filed Jan. 8, 1981, Ser. No. 223,392
Int. Cl.³ A24C 5/50
U.S. Cl. 493—45 17 Claims

1. An apparatus for the production of cigarette filter tip assemblies having multi-sectional construction, said apparatus comprising

a flat cutting means for cutting a delivered rod of entrainment type filter material into disparate plugs;

a first conveyor for receiving and conveying the cut plugs from said cutting means;

means for spacing the plugs on said first conveyor relative to each other at predetermined spacings;

a second conveyor having an endless belt for receiving and conveying a strip of mouthpiece paper with the spaced plugs thereon along a predetermined path;

a garniture having a first section in said path for forming said belt and the mouthpiece paper into a U-shape, a following neck-down section for laterally compressing the plugs and

a folding section for forming the strip of mouthpiece paper into an overlapped tube;

feed means above said second conveyor and said neck-down section of said garniture for feeding granular absorptive-type filter material into each determinate space between successive plugs on said belt, said feed means including a wheel rotatably mounted on a first axis and having a plurality of circumferentially spaced radial chambers for receiving granular absorptive-type filter material therein, a plurality of plungers, each said plunger being slidably mounted in a respective chamber and a cam wheel rotatably mounted on a second axis parallel to said first axis and having a plurality of circumferentially spaced pins for sequentially engaging said plungers at an initial position spaced before the bottom dead center portion of said plungers to gradually push said plungers into said respective chambers to expel the granular filter material therein at a point above said neck-down section of said garniture;

sealing means for sealing the overlapped strip of mouthpiece paper to form a rod-shaped assembly of alternating sections of plugs and granular filter material; and

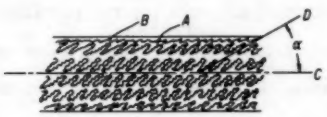
a second cutting means for severing the rod-shaped assembly into filter plugs of determinate length.

4,411,641

METHOD FOR PRODUCING A TOBACCO SMOKE FILTER PLUG

Migaku Suzuki, Kawanoe, and Takashi Sakai, Toyama, both of Japan, assignors to Mitsubishi Rayon Co. Ltd. and Mitsubishi Adetate Co. Ltd., both of Tokyo, Japan

Division of Ser. No. 137,267, Apr. 4, 1980, Pat. No. 4,316,475. This application Sep. 28, 1981, Ser. No. 306,243
Claims priority, application Japan, Apr. 12, 1979, 54-44647
Int. Cl.³ A24D *3/02, 3/04*
U.S. Cl. 493—46 **8 Claims**



1. A method for producing a tobacco smoke filter plug composed of an inner core phase A and an outer skin layer B different from each other in fibrous arrangement structure thereof, said inner core phase A consisting of fillings in a folded arrangement structure having a folding axis forming an angle of α with respect to the central longitudinal axis the filter plug in cross section, and said outer layer B consisting of fillings in a folded structure substantially parallel to the central longitudinal axis of the filter plug in cross section and surrounding said inner core phase, an improvement comprising the following steps:

feeding a fiber's tow through air jet means having a bill portion so that the tow is folded in the vertical direction to the longitudinal axis of the filter plug within a hollow space in a tongue portion of a filter plug machine;

drawing the outer peripheral portion of the folded fiber's tow in another direction substantially opposite to a plug producing direction of the tongue portion by utilizing air flow escaping from the end portion of the bill portion to thereby forming the outer skin layer B;

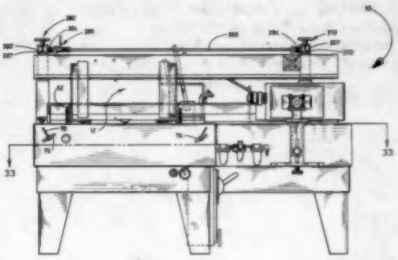
applying sheering stress to the folding fiber's tow between the garniture type and the tongue to thereby form said core phase A having a folded angled fibrous structure.

4,411,642

CARTON-ERECTING MACHINE

Minor E. Gee, Sanger, Calif., assignor to Maxco Supply, Inc., Reedley, Calif.

Filed Nov. 5, 1980, Ser. No. 204,201
Int. Cl.³ B31B *1/80, 5/00*
U.S. Cl. 493—125 **7 Claims**



3. For use in combination with a case-squaring machine having means for erecting cases characterized by trailing flaps adapted to be in-folded about a vertical axis, a trailing flap striker assembly comprising:

A. an elevator arm supported at said case-squaring station beneath said track and having one end mounted for pivotal displacement about a horizontal axis;

B. a pivotal striker mounted on said arm opposite said one end; and

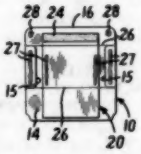
C. elevating means including a normally, substantially relaxed chain for supporting said arm in a vertical plane responsive to a tensioning thereof for imparting upward pivotal displacement to said arm, and means for tensioning said chain for lifting said arm, whereby said pivotal striker is elevated above the plane of said track.

4,411,643

DOUBLE ENVELOPE AND METHOD OF MAKING SAME

Richard L. Higginson, Mahwah, N.J., assignor to Berlin & Jones Company, Inc., East Rutherford, N.J.

Filed Feb. 10, 1981, Ser. No. 233,167
Int. Cl.³ B31B *41/00*
U.S. Cl. 493—188 **16 Claims**



1. A method of making a double envelope comprised of one envelope inside another envelope in one pass on an envelope folding machine, said method comprising the steps of:

providing a pre-cut envelope blank foldable into an envelope and a paper blank of smaller size than the envelope blank;

adhering the paper blank to the envelope blank in superposed relationship with fugitive adhesive;

applying remoistenable seal gum to the upper edge portion of the paper blank adhered to the envelope blank;

drying the seal gum; and

scoring the adhered together envelope and paper blanks at predetermined locations, and folding the scored blanks and applying adhesive to predetermined areas of the

scored blanks to form an outer envelope from said envelope blank and an inner envelope inside said outer envelope from said paper blank.

4,411,644

METHOD AND APPARATUS FOR FORMING RECLOSABLE PACKAGES

Lloyd Tinklenberg, Worthington, Minn., assignor to Bedford Industries, Inc., Worthington, Minn.

Continuation-in-part of Ser. No. 112,542, Jan. 16, 1980, abandoned. This application Jan. 8, 1981, Ser. No. 223,408

Int. Cl.³ B31B *1/90*

U.S. Cl. 493—213 **7 Claims**

1. The method of forming substantially instantly openable and reclosable packages having opposing walls terminating at an openable but flattened mouth at which said opposing walls are in substantially face to face relationship, comprising:

(a) mounting a coil of tape on a shaft for payout of said tape from said coil, said tape having a body mass comprising a layer of non-tacky thermoplastic polymeric material, an elongated tearstrip member embedded in said polymeric layer at a location intermediately between the side edges of said tape and extending as a straight longitudinal member throughout the length of said tape, said tearstrip member having a greater tensile strength than said body mass of said tape, and at least one deadfold strip embedded in said polymeric layer at a location between said tearstrip member and one lateral edge of said tape and extending as a longitudinal strip in said tape,

(b) flattening the mouths of packages and moving the flattened mouths in lengthwise spaced relationship along a line,

(c) drawing said tape from said coil toward said line of flattened mouths,

(d) activating to tackiness a normally non-tacky thermoplastic adhesive in preparation for bonding said tape to said flattened mouths,

(e) then applying and bonding lateral portions of said tape to the outside of opposing walls of said packages adjacent said flattened mouths with said activated thermoplastic adhesive as the bonding material and with said tearstrip structure of said tape aligned along the line of said flattened mouths, and

(f) transversely cutting said tape at locations spaced from portions of said tape bonded to said packages.

4,411,645

SYSTEMS OF SELF-PURGING CENTRIFUGAL SEPARATORS FOR THE SEPARATION AND CLARIFICATION OF LIQUIDS CONTAINING SOLIDS

Aloys Tenthoff, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

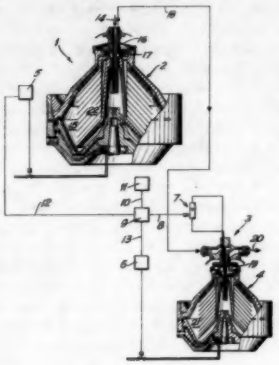
Filed Sep. 9, 1982, Ser. No. 416,539

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136627

Int. Cl.³ B04B *11/04*; B01D *21/26*

U.S. Cl. 494—3 **3 Claims**

1. In a system for the separation and clarification of liquids having at least two self-purging centrifugal separators connected in series wherein preliminary separation is effected in the drum of the first separator and clarification is effected in the drum of the second separator and control means for initiating the purging operations of the drums filled with solids in a periodic manner, the improvement wherein: the solid chamber of the drum of the second separator is smaller than that of the first and includes automatic purge control means for non-periodically, initiating a purge thereof in response to a given solids content therein and the control means comprises evaluating means connected to the automatic purge control means for effecting the simultaneous purging of both drums in response



to the initiation of a non-periodical purge of the second drum and alarm means connected to the evaluating means for effecting an alarm in response to a predetermined number of purges initiated by the evaluating means.

4,411,646

DECANTER CENTRIFUGE HAVING DIFFERENTIAL DRIVE UNIT

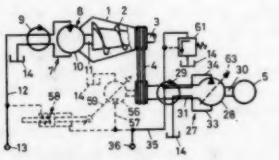
Ivan J. Cyphelly, Neuhaus, 8128 Hinteregg, Switzerland

Filed May 12, 1981, Ser. No. 263,013

Claims priority, application Switzerland, May 16, 1980, 3854/80

Int. Cl.³ B04B *3/04, 9/06*

U.S. Cl. 494—53 **10 Claims**

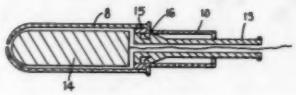


1. A decanter centrifuge comprising a drum, a drum hydraulic drive motor, means operatively drivingly connecting said drum and said drum drive motor, a worm gear rotatably mounted inside said drum, a differential drive unit comprising a worm gear hydraulic motor for driving said worm gear at a rate of rotation different from that of the drum, a coupling pump operatively arranged in the power train between said worm gear drive motor and said worm gear, and a single pressure feed system feeding both said drum drive motor and said coupling pump of said differential drive unit with pressurized fluid.

4,411,647
TAMPON APPLICATOR

Akira Sakurai, Utsunomiya; Takashi Nakanishi, Mashikomachi, and Akio Nishimura, Ichikaimachi, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Aug. 5, 1981, Ser. No. 290,048
Claims priority, application Japan, Aug. 11, 1980, 55-110040
Int. Cl.³ A61F 13/20
U.S. Cl. 604—16 9 Claims

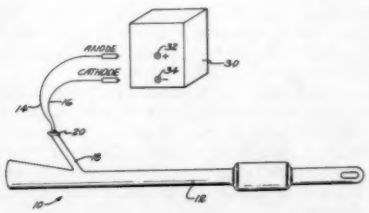


1. A tampon applicator, comprising: an outer cylinder having a front end and a rear end; a tampon contained in said outer cylinder and adapted to be pushed out of the front end of said outer cylinder; pushing means for pushing said tampon out of the front end of said outer cylinder, said pushing means comprising a first inner cylinder mounted for lengthwise sliding movement within said outer cylinder and having a front end and a rear end, the front end of said first inner cylinder being adapted to engage the rearward end of said tampon to push same out of said outer cylinder when said first inner cylinder is pushed forwardly in said outer cylinder, said first inner cylinder having laterally extending wall means longitudinally spaced from the front end thereof, and a second inner cylinder mounted for lengthwise sliding movement within said first inner cylinder and being movable independently of said outer cylinder, said second, inner cylinder having at least one projection received within said first inner cylinder and extending outwardly from the external wall of said second inner cylinder toward the internal wall of said first inner cylinder, said projection being movable past said wall means when said second inner cylinder is moved toward the rear end of said first inner cylinder and then being engageable with the rearward side of said wall means so that subsequent forward movement of said second inner cylinder will move said first inner cylinder forwardly in said outer cylinder.

4,411,648
IONTOPHORETIC CATHETER DEVICE

Charles P. Davis; Michael M. Warren, both of Galveston, Tex., and David W. Arnett, Monrovia, Calif., assignors to Board of Regents, The University of Texas System, Austin, Tex.

Filed Jun. 11, 1981, Ser. No. 272,484
Int. Cl.³ A61H 1/30
U.S. Cl. 604—21 10 Claims



1. Apparatus adapted for iontophoresis application to provide antibacterial activity which comprises:

a catheter adapted for physiological use comprising an elongated tubular member having an orifice at the distal end for the passage of electrolyte fluid therethrough;

a positive electrode containing a heavy metal, the positive electrode disposed and terminating internally to the tubular member, and having a surface exposed to the lumen of the tubular member proximate the orifice;

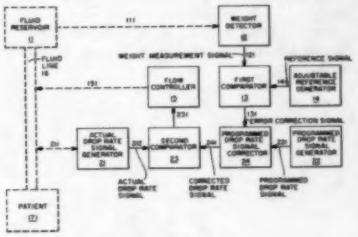
a negative electrode disposed and terminating internally to the tubular member, the negative electrode having a surface exposed to the lumen of the tubular member proximate the orifice; and

means for conductive electrical connection to a constant current source from each of the said positive and negative electrodes.

4,411,649
FLUID FLOW CONTROL SYSTEM

Dean L. Kamen, Bedford, N.H., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 56,871, Jul. 12, 1979, abandoned. This application Apr. 15, 1981, Ser. No. 254,304
Int. Cl.³ A61M 5/00
U.S. Cl. 604—65 1 Claim



1. A system for controlling in a desired manner the flow of fluid in a line from a reservoir through a drip chamber to a patient, such system comprising:

first means, for generating a first electrical signal indicative of the weight of the fluid in the reservoir, such first signal hereinafter called the "weight measurement signal";

second means, for generating a second electrical signal indicative of the desired weight of the fluid in the reservoir, as a function of time and thereby indicative of the desired rate of flow of fluid from the reservoir, such second signal hereinafter called the "weight reference signal";

a first comparator, having two inputs, on one of which is impressed the weight measurement signal and on another of which is impressed the weight reference signal, and also having an output indicative of the dissimilarity between the weight measurement and weight reference signals;

third means, for controlling flow of the fluid from the reservoir at a rate dependent upon an electrical input thereto, such input being connected so as to receive a signal related to that present at the first comparator's output;

fourth means, placed in the line of flow from the reservoir, (i) for determining the rate at which the drops in the drip chamber are flowing, and (ii) for producing a third electrical signal approximately indicative of the rate of fluid flow, such third signal hereinafter called the "actual drop rate signal";

fifth means, for generating a fourth electrical signal indicative of the desired actual drop rate signal, such fourth signal hereinafter called the "programmed drop rate signal;"

sixth means, having one input on which is placed the programmed drop rate signal and another input to which is connected the output from the first comparator, for modifying the programmed drop rate signal in response to an error correction signal input from the output of the first comparator, so as to produce at an output a fifth electrical signal hereinafter called the "corrected drop rate signal";

a second comparator, having two inputs, on one of which is impressed the actual drop rate signal and on the other one of which is impressed the corrected drop rate signal, and

also having an output indicative of the dissimilarity between the actual drop rate signal and the corrected drop rate signal, such output connected to the electrical input of the third means;

whereby the fluid flow rate is directly controlled by the dissimilarity between the drop rate measured by the fourth means and the drop rate specified by the sixth means, and the drop rate specified by the sixth means is corrected by the first comparator's output, so that the flow rate of the fluid is ultimately controlled by the second means.

4,411,650

PISTON PUMP FOR NEEDLE-LESS INJECTION INSTRUMENTS

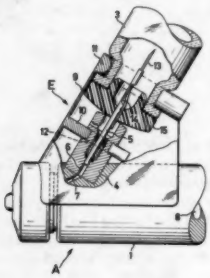
Hans-Jürgen Dettbarn, Marburg, and Josef Zimmermann, Sulzbach, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 14, 1982, Ser. No. 368,170

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1981, 3115372

Int. Cl.³ A61M *5/30*

U.S. Cl. 604—72 **4 Claims**



1. A piston pump for needle-less injection instruments, in which the pump housing has a mounting for a vessel for the medium to be injected, this mounting consisting of a pipe end which is provided with a hollow needle for receiving the vessel and which is part of the pump housing and of a connecting element for connecting the vessel to the pipe end, the pump housing having an inlet channel connected to a channel in the pipe end, wherein the connecting element consists of a metal sheet **(9)** bent in the form of a U, which is provided on its inner side with U-shaped yokes **(10, 11)**, the yoke **(10)** facing the pump housing **(1)** engaging into a groove **(12)** provided in the pipe end **(4)** and the other yoke **(11)** serving for surrounding the vessel neck.

4,411,651

DEVICE AND METHOD USEFUL IN MONITORING FLUID FLOW IN A DRUG INJECTOR

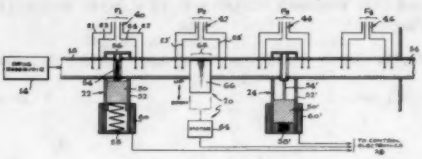
Joseph H. Schulman, Los Angeles, Calif., assignor to Pacesetter Systems, Inc., Sylmar, Calif.

Filed May 26, 1981, Ser. No. 266,835

Int. Cl.³ A61M *5/00*

U.S. Cl. 604—151 **24 Claims**

1. In a peristaltic pump having a conduit and at least one valve means for restricting fluid flow through said conduit, a means for determining the position of said valve means comprising monitoring means for generating a signal related to the electrical resistance of fluid between two points located within said conduit and on opposite sides of said valve means, said electrical resistance being related to the cross-sectional area of a portion of said conduit whose cross-sectional area is altered



by said valve means, said electrical resistance thus being related to the position of said valve means.

4,411,652

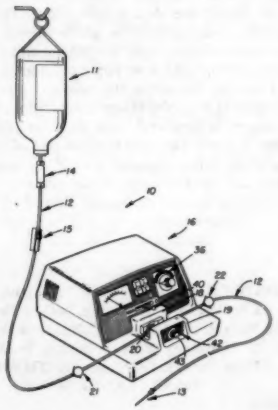
INTERNALLY STERILE PULSATILE INFUSOR SYSTEM

Steven G. Kramer, and Edward Q. Yavitz, both of San Francisco, Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Aug. 21, 1981, Ser. No. 295,024

Int. Cl.³ A61M *5/00*; F04B *45/06*

U.S. Cl. 604—153 **16 Claims**



1. An internally sterile pulsatile infusor system comprising

a closed, sterile source of a liquid infusion solution,

a conduit having its first end connected to said source to receive said solution therefrom,

a cannula connected to a second end of said conduit,

elastic reservoir means connected in said conduit for receiving and communicating said solution to said cannula,

check valve means in said conduit for continuously permitting solution flow only from said source to said elastic reservoir means and for preventing reflux of said solution therepast,

compression means for intermittently compressing said elastic reservoir means to create a series of pulsating discharges of said solution through said cannula and

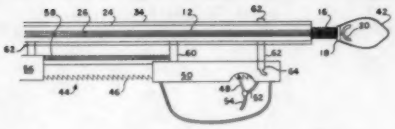
rate control means for selectively varying the rate of compression of said compression means, said rate control means including variable means for varying the rate of said compressions within the approximate range of from 0 to 10 compressions per second.

4,411,653

CANNULA INTRODUCER

M. Dean Razi, 5800-49th St. N., St. Petersburg, Fla. 33709

Filed Jan. 28, 1982, Ser. No. 343,408
Int. Cl.³ A61M 5/00
U.S. Cl. 604—157 5 Claims



1. A surgical device for insertion of aortic cannula of the type including an elongate, thin rod member, a blade member integrally formed with said rod member, disposed at the distal end of said rod member, an elongate housing member, an elongate bore formed in said housing member, substantially centrally thereof, wherein said rod member is slideably disposed interiorly of said bore and movably mounted therein between a blade member-extended position and a blade member-retracted position, a bias means disposed at the proximal end of said rod member for retaining said blade member in its retracted position in the absence of external, longitudinally directed forces imparted against said rod member, and an elongate, flexible cannula member having said housing member slideably disposed therein, wherein the improvement comprises:

a trigger-operated means for effecting the longitudinal displacement of said cannula member into an aorta through a cut made by said blade member,

said trigger-operated means comprising a hollow, longitudinally disposed base member,

an elongate rack gear member slideably disposed interiorly of said blade member,

a pawl member operatively disposed relative to said gear member and operable to allow unidirectional movement of said base member when said pawl member engages said gear member,

a trigger member operatively secured to said pawl member,

a longitudinally disposed second bias means having a stationary distal end and a proximal end fixedly secured to said base member so that sliding said base member in a distal-to-proximal direction loads said second bias means,

a clamping member for securing said cannula member to said base member,

a hook member associated with said clamping member,

said trigger member operatively connected to said hook member,

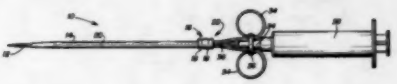
whereby said cannula member is prepared for aortic insertion by manually retracting said base member, thereby retracting said cannula member, said retraction loading said second bias means, and said pawl member, co-acting with said gear member, operable to prevent untimely unloading of said second bias means, and whereby manual activation of said trigger member is operative to disengage said pawl member from said gear member and is further operative to disengage said hook member from said bias member to the end that such trigger activation allows said second bias means to unload, thereby driving said cannula member in a proximal-to-distal direction so that said cannula is thrust through the cut made in said aorta prior to activation of said trigger member.

4,411,654

PEELABLE CATHETER WITH SECURING RING AND SUTURE SLEEVE

Edward J. Boarini, Cary, and Joseph W. Jonker, Round Lake, both of Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 30, 1981, Ser. No. 259,280
Int. Cl.³ A61M 25/00
U.S. Cl. 604—165 24 Claims



1. In a two-step introduction assembly for implanting an introducer catheter within a patient to provide a path for introduction of a primary device, whereby the introducer catheter may be removed and discarded while the primary device remains in operative position, the assembly including a needle for venipuncture and a peelable introducer catheter over the needle having at least one longitudinal rupture means for substantially its entire length along which the catheter may be ruptured, the improvement comprising:

(a) a slidable sleeve snuggly engaging the introducer catheter tube having a proximal end and a distal end and slidably mounted about the proximal end of the catheter to protect the catheter from inadvertent separation along the rutpure means and being slidable to the distal end of said catheter tube under the influence of manual disruption of the catheter tube along the rupture line from the proximal end, whereby the introducer catheter tube may be discarded after disruption along the rupture line while the sleeve remains in position on the primary device as a securing site; and

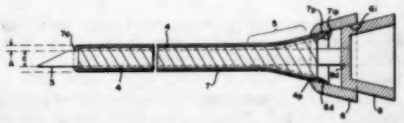
(b) a securing ring snuggly engaging the introducer catheter and needle at the proximal end of the catheter and needle, said ring being affixed to said catheter and needle so as to prevent rotation of the catheter with respect to the needle during implantation and being sufficiently weak that it may be broken under the influence of manually applied pressure.

4,411,655

APPARATUS AND METHOD FOR PERCUTANEOUS CATHETERIZATION

David M. Schreck, 14 Sylvan Ter., Summit, N.J. 07901

Filed Nov. 30, 1981, Ser. No. 325,848
Int. Cl.³ A61M 5/00, 29/00
U.S. Cl. 604—165 10 Claims

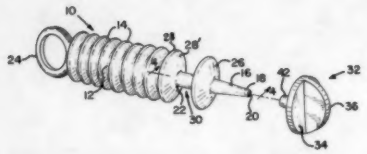


1. A device for introducing a large bore diagnostic or therapeutic catheter into a body compartment or vessel, comprising a thin wall cannula of shape memory alloy having an inner diameter fashioned to embrace the shank of a hypodermic needle, said cannula exhibiting, in its martensitic phase, an outer diameter convenient for percutaneous puncture of a body compartment or vessel and exhibiting, in its austentitic beta-phase, an inner diameter to slidably accomodate the outer diameter of said large bore diagnostic or therapeutic catheter, and a dilatable elastomeric cylindrical sheath deployed over the surface of said cannula.

4,411,656
COMPRESSIBLE SYRINGE

Walter G. Cornett, III, Wheeling, Ill., assignor to Urologic & Enteric Research Associates, Wheeling, Ill.

Filed Jan. 29, 1982, Ser. No. 343,886
Int. Cl.³ A61M 1/00
U.S. Cl. 604—212 8 Claims



1. In a syringe of the type having a hollow body made compressible by bellow structures and a tubular neck wherein one end of the neck is axially mounted to a terminal portion of the body and the other end of the neck tapers inward to form a tip having an opening through which fluid may pass upon compression of the body, the improvement comprising:

a first hollow platform molded into said terminal portion and perpendicular to the longitudinal axis of the syringe so that said neck protrudes from the center of one side of said first platform while the other side of said platform is contiguous with said body, such that the interiors of said body and said first platform are in communication with each other; and

a second hollow platform molded into an intermediate portion of said neck and perpendicular to the longitudinal axis of the syringe and parallel to said first platform so that said neck centrally enters one surface of said second platform and centrally exits from the opposing surface of said second platform so that the interiors of said neck and said second platform are in direct communication with each other and a space is formed between said first and second platforms to provide a gripping region for a user's fingers during operation of the syringe.

4,411,657
HYPODERMIC NEEDLE

Anibal Galindo, 6500 Caballero Blvd., Coral Gables, Fla. 33146

Continuation of Ser. No. 151,378, May 19, 1980, abandoned.
This application Mar. 1, 1982, Ser. No. 353,517
Int. Cl.³ A61M 5/32
U.S. Cl. 604—274 5 Claims

1. A new and improved nerve anesthesia needle for reducing or eliminating trauma to nerve fascicles during the injection of an anesthesia, comprising:

a hub;

an elongated, rigid electrically conductive shaft of predetermined length and diameter, said shaft having one end connected to said hub; said shaft includes a fluid conduit means for transporting anesthesia to a nerve;

said shaft having a smooth pointed cone-shaped tip means connected to said shaft, said smooth tip means for penetrating without cutting nerves and for locating the nerve through electrical conductivity of said shaft and for paraneurally depositing anesthesia at the located nerve;

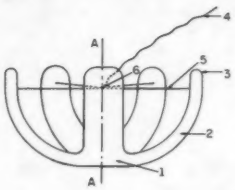
said smooth tip means including only a penetrating point for preventing cutting of the nerve;

dispensing means connected to said conduit means for allowing fluid to be dispensed from said shaft, said dispensing means for dispensing anesthesia paraneurally, said dispensing means spaced from said point and including exit opening area means for preventing nerve damage.

4,411,658
DEVICE FOR ADMINISTERING

Etienne Godbille, Villemomble; Pierre Escuret, Paris, and Jean-Pierre Scheid, Vaujours, all of France, assignors to Roussel Uclaf, Romainville, France

Filed Feb. 17, 1981, Ser. No. 234,841
Claims priority, application France, Feb. 18, 1980, 8003478
Int. Cl.³ A61M 7/00
U.S. Cl. 604—285 6 Claims

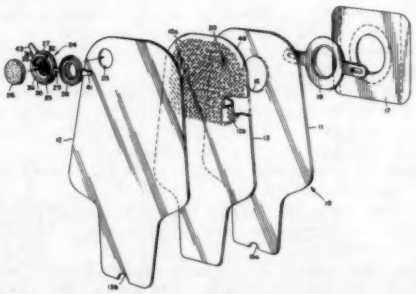


1. A device for the vaginal administration of medicinal substances comprising a flat, supple, elastically deformable biologically inactive material having a constant thickness and shaped in the form of a star having at least three identical arms having constant width and rounded extremities containing at least one biologically active substance incorporated in its mass and having means for imparting a spherical-like form which comprises a flexible manipulating cord fixed to the centre of the star shaped flat piece.

4,411,659
DRAINABLE COLLECTION POUCH AND FILTER ASSEMBLY THEREFOR

Marvin E. Jensen, Niles, and Mahmood Mohiuddin, Lake Zurich, both of Ill., assignors to Hollister Incorporated, Libertyville, Ill.

Filed Mar. 16, 1982, Ser. No. 358,819
Int. Cl.³ A61F 5/44
U.S. Cl. 604—332 29 Claims



19. An ostomy pouch having front and rear walls, and an intermediate barrier wall therebetween, all formed of thermoplastic film; said walls having edges sealed together to provide said pouch with a pair of adjacent chambers separated by said intermediate barrier wall; said rear wall having a stoma opening disposed generally along the vertical midline of said rear wall; adhesive sealing means provided by said rear wall for peristomal sealing engagement with a wearer; a vent aperture in said intermediate wall at a point spaced laterally from said stoma opening and disposed at an elevation no lower than said stoma opening when said pouch is supported vertically; a gas

discharge port in said front wall at a point spaced laterally from said aperture; a filter element; and a filter holder externally sealed to said front wall about said gas discharge port and removably supporting said filter element at said port.

4,411,660

ABSORBENT PRODUCT AND ARTICLES MADE THEREFROM

Frederic S. Dawn, Houston, and James V. Correale, Seabrook, both of Tex., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Division of Ser. No. 219,681, Dec. 24, 1981, Pat. No. 4,338,371.
This application Apr. 14, 1982, Ser. No. 368,187
Int. Cl.³ A61F *13/16*
U.S. Cl. 604—396 **1 Claim**

1. A fluid absorbent undergarment such as a panty and the like having a front, rear and opposite sides cooperating to define a lower torso garment having a waist opening, said undergarment including an outer covvering, said inner core being generally encapsulated in said outer covering and extending generally throughout said undergarment, said inner core comprising a multi-layered, absorbent product comprising:

a. a water pervious facing layer for contacting the skin;

b. a first fibrous, wicking layer contiguous said water pervious layer;

c. a first container section having an inner layer and an outer layer forming a first absorbent container therebetween, said container section being comprised of a water pervious material, said inner layer being contiguous said first fibrous, wicking layer;

d. a first absorbent mass disposed in said first absorbent container, said first absorbent mass comprising a super absorbent high molecular weight acrylic polymer containing hydrophilic carboxylate groups said polymer forming a gel upon contact with an aqueous medium;

e. a second container section having an inner layer and said outer layer container therebetween, said second container section being comprised of a water pervious material, said inner layer of said second container section being contiguous said outer layer of said first container section;

f. a second absorbent mass disposed in said second absorbent container, said second absorbent mass comprising a hydrolyzed starch-acrylonitrile graft copolymer, said copolymer forming a gel upon content with an aqueous medium; and

g. a liquid impermeable/gas permeable layer contiguous said outer layer of said second container section.

4,411,661

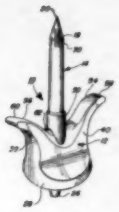
SPIKE CONNECTOR

Jean Kersten, Villers St. Amand, Belgium, assignor to Travenol European Research and Development Centre, Brussels, Belgium

Continuation of Ser. No. 199,140, Oct. 22, 1980, abandoned.
This application Jul. 19, 1982, Ser. No. 399,511
Int. Cl.³ B67B *7/24;* A61M *5/16*
U.S. Cl. 604—411 **12 Claims**

1. A spike connector having a main body portion and a hollowed spike extending therefrom for insertion into the stopper of a fluid source and for conveyance of the fluid from the source through the spike and main body portion, the improvement comprising:

said main body portion including a pair of wings extending upwardly in the direction of said spike but outwardly therefrom, said pair of wings extending away from each other, the undersides of said wings being arcuately constructed to enable an operator to grab said main body portion at said undersides, and the tops of said wings



serving to space other than said wing tops away from the fluid source stopper when the spike is inserted into the stopper;

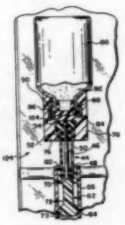
said main body portion having a generally circular cross-sectional configuration perpendicular to said spike and at the end thereof that is distal from said spike, and means adjacent the circular cross-sectional portion for receiving a drip chamber.

4,411,662

STERILE COUPLING

Stephen Pearson, Ingleside, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Apr. 6, 1982, Ser. No. 365,943
Int. Cl.³ A61M *5/00;* A61J *1/00*
U.S. Cl. 604—411 **17 Claims**



1. A sterile coupling enabling the selective establishment of a sterile pathway between two separate receptacles, said coupling comprising:

(a) first means to access one of the receptacles, said first access means including an end portion;

(b) second means to access the other of the receptacles, said second access means including an end portion;

(c) a junction means permanently affixed about at least said end portions of both of said first and second access means, said junction means maintaining said end portions in sterile, relation;

(d) one of said first and second access means including a piercing element capable of piercing said junction means between said end portions so as to selectively bring the access means into pathway communication and thereby establish a sterile pathway between the receptacles, through said first and second access means.

4,411,663

REACTABLE REAGENTS WITH SUBSTRATES

Alfred E. Lauchenauer, Horn, Switzerland, assignor to Adnovum AG, Horn, Switzerland

Filed Jul. 21, 1981, Ser. No. 285,681
Int. Cl.[3] D06L *3/14, 1/00;* D06B *1/04;* D06M *1/22*
U.S. Cl. 8—107 12 Claims

1. In a process for treating a sheet of a web surface material with reagents, which method comprises:

establishing a reagent in a liquid phase;

forming a foam of said liquid phase;

applying said foam to said web surface to be treated;

causing a portion of the foam to collapse and deposit said reagent on said web surface;

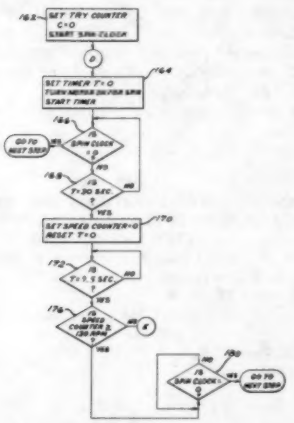
the improvement which comprises establishing a temperature gradient through the web surface into said foam applied thereto, thereby causing a collapse of the foam substantially only at the foam/surface interface, at ambient pressure, whereby the reagent application rate to said web surface is determined by the proportion of the foam which collapses, and immediately terminating any interaction between the foam and the web surface.

4,411,664

WASHING MACHINE WITH OUT-OF-BALANCE DETECTION AND CORRECTION CAPABILITY

Jimmy R. Rickard, and Robert K. Hollenbeck, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Apr. 30, 1982, Ser. No. 373,591
Int. Cl.[3] D06F *23/04, 33/02*
U.S. Cl. 8—158 13 Claims



1. A clothes washing appliance of the vertical axis type for a clothes washing operation having a plurality of cycles including wash and spin cycles, said appliance comprising:

a substantially stationary tub;

a clothes receiving basket movably supported in said tub;

means for distributing fill water to the articles received in said basket;

fill valve means for controlling the delivery of fill water from an external supply to said distributing means;

motor means selectively operative in a wash mode and a spin mode to provide wash and spin operating cycles, respectively;

pump means for removing water from said tub;

clutch means to limit the maximum torque value available to the basket in the spin mode; and

control means for detecting an out of balance condition in the spin mode and initiating a rebalancing operation including means for measuring basket rotational speed during the spin mode and means responsive to detection of basket rotational speed being less than a predetermined normal balanced basket rotational speed at a predetermined time in the spin cycle to interrupt the spin cycle and to actuate a rebalance cycle and thereafter to resume the spin cycle.

7. A method for detecting and correcting an out of balance condition in an automatic washing appliance of the vertical axis type having a plurality of cycles including wash and spin cycles and having a substantially stationary tub and a clothes receiving basket movably supported in the tub including means for distributing fill water to the articles received in the basket and fill means for controlling the delivery of fill water from an external source to the distributing means, and having a motor means selectively operative in a wash mode and a spin mode to provide wash and spin operating cycles of predetermined lengths of time and including pump means for removing water from the tub and means to limit the maximum torque available to the basket in the spin mode, the method comprising the steps of;

measuring the basket rotational speed during the spin cycle;

detecting the basket rotational speed being less than a predetermined normal balanced basket rotational speed at a predetermined time in the spin cycle;

interrupting the spin cycle;

actuating a rebalance cycle, and

resuming the spin cycle after completion of the rebalance cycle.

4,411,665

DYEING PROCESS USING ALKOXYLATED FATTY AMINES AND POLYAMINES AS RESERVING AGENTS

Hermann Egli, Basel, and Emil Engeler, Binningen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 117,254, Jan. 31, 1980, Pat. No. 4,285,691. This application Jun. 26, 1981, Ser. No. 277,860
Claims priority, application Switzerland, Feb. 6, 1979, 1149/79
The portion of the term of this patent subsequent to Aug. 25, 1998, has been disclaimed.
Int. Cl.[3] D06P *5/12, 5/00, 5/13, 3/87*
U.S. Cl. 8—455 30 Claims

1. In a wet-on-wet process for dyeing an anionic dyeable substrate with reserve effects, the improvement which comprises applying to at least one common area of the substrate, in one step, an acid dyeing liquor containing an anionic dye having a K'_{pH6}-value ≥ 5, and in a separate step, an alkoxylated fatty amine or polyamine having affinity for anionic dyes with a K'_{pH6}-value ≥ 5, there being no rinsing or drying of the substrate between said steps.

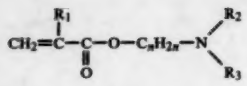
4,411,666

PROCESS FOR DYEING POLYOLEFIN FIBER MATERIALS

Shuhei Hashizume, Settsu; Sadaharu Abeta, Toyonaka; Tadayuki Ohmae, and Hajime Nishihara, both of Niihama, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 255,841, Apr. 20, 1981, abandoned. This application Feb. 8, 1982, Ser. No. 346,537
Claims priority, application Japan, Apr. 25, 1980, 55-55690; Feb. 6, 1981, 56-17242
Int. Cl.[3] D06P *1/653, 1/39, 3/85*
U.S. Cl. 8—455 7 Claims

1. A process for dyeing polyolefin fiber materials, which comprises contacting a polyolefin fiber material obtained by melt-spinning a mixture of crystalline polyolefin and 0.1 to 30% by weight based on the weight of the polyolefin of a copolymer of ethylene and an aminoalkyl acrylate compound represented by the formula



wherein R_1 represents hydrogen atom or methyl group, R_2 and R_3 each represents hydrogen atom or an alkyl group having 1 to 4 carbon atoms, and n represents an integer from 1 to 4, or a blend product of the said polyolefin fiber material and a polyamide fiber material, with a dye bath containing an anionic dye and at least one carboxylic acid selected from the group consisting of benzoic acid, salicylic acid, p-chlorobenzoic acid and 5-chlorosalicylic acid.

4,411,667

TRANSFER PRINTING METAL SHEET COATED WITH THERMOSET LAYER WHILE STILL HOT FROM CURING

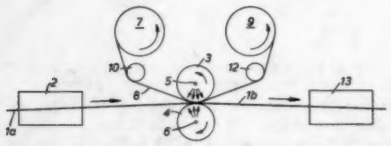
Douglas Meredith, and James A. Cronin, both of Abergavenny, Wales, assignors to British Steel Corporation, London, England

Filed Mar. 2, 1982, Ser. No. 354,074

Claims priority, application United Kingdom, Mar. 10, 1981, 8107541

Int. Cl.³ B41M 5/00; B44C 1/16

U.S. Cl. 8—471 **12 Claims**



1. A method of transfer printing in which a continuous length of metal strip is coated with a thermo-setting coating material and cured, in which, immediately after curing at a temperature of between 180° C. and 280° C., the coated surface of the strip is brought into contact with a continuous strip of printed material comprising an ink print containing a sublimable dye, the contact being effected during the passage of both strips between the nip of two opposed resiliently surfaced rollers at a pressure of at least 50 p.s.i., the dye of the ink print being transferred by sublimation utilizing the residual heat of the strip following the curing of the thermosetting coating material.

4,411,668

LIQUID DYESTUFF PREPARATIONS

Suresh C. Agarwal, Bottmingen; Horst Jäger, Bettingen; Nitya G. Podder, Duggingen, and Hans Mollet, Reinach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

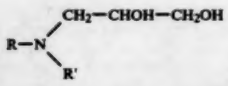
Filed Jan. 20, 1982, Ser. No. 340,685

Claims priority, application Switzerland, Jan. 26, 1981, 473/81

Int. Cl.³ C09B 67/18, 67/40; D06P 1/645

U.S. Cl. 8—527 **12 Claims**

1. A liquid dyestuff preparation comprising water, a water-insoluble or sparingly water-soluble dye, a disperstant, a humectant, and optionally further additives, wherein said humectant is a compound of the formula I



(I)

wherein R is a C_1–C_{16}alkyl group which is unsubstituted or substituted by OH, CN, halogen or —N(C_1–C_4alkyl)$_2$, and R' is hydrogen or the —CH_2—CHOH—CH_2OH group.

4,411,669

PROCESSES FOR DYEING PAPER, AND AGENTS CONTAINING AZO DYESTUFFS

Peter Wild, Alten Buseck, and Horst Nickel, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

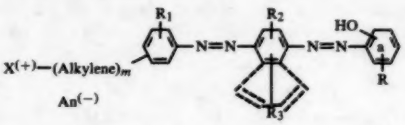
Filed Feb. 26, 1982, Ser. No. 352,722

Claims priority, application Fed. Rep. of Germany, Mar. 17, 1981, 3110223

Int. Cl.³ D06P 1/41; D21H 3/80, 1/46

U.S. Cl. 8—654 **12 Claims**

1. Process for dyeing paper, comprising contacting paper or paper pulp with cationic azo dyestuffs of the formula



(I)

wherein

$X^{(+)}$ denotes an ammonium group,

m denotes 0 or 1,

R denotes hydrogen, halogen, C_1- to C_4-alkyl, C_1- to C_4-alkoxy, hydroxyl, amino, sulphonamido, carboxamido, or acylamino which is unsubstituted or substituted by halogen or a quaternary group,

R^1 denotes hydrogen, C_1- to C_4-alkyl, halogen or C_1- to C_4-alkoxy,

R_2 and R_3 independently of one another denote hydrogen, C_1- to C_4-alkyl, C_1- to C_4-alkoxy or acylamino, and

$An^{(-)}$ denotes an anion, and

wherein further carbocyclic or heterocyclic rings are fused to ring a.

4,411,670

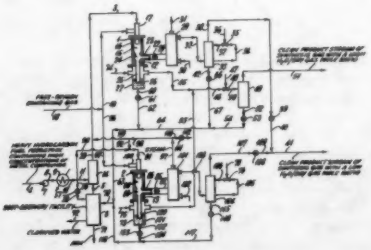
PRODUCTION OF SYNTHESIS GAS FROM HEAVY HYDROCARBON FUELS CONTAINING HIGH METAL CONCENTRATIONS

Charles P. Marion, Mamaroneck, and Frederick C. Jahnke, Rye, both of N.Y., assignors to Texaco Development Corporation, White Plains, N.Y.

Filed Jun. 7, 1982, Ser. No. 385,742

Int. Cl.³ C10J 3/46

U.S. Cl. 48—197 R **10 Claims**



1. A partial oxidation process comprising:

(1) reacting a reactant fuel feedstream comprising a heavy hydrocarbon fuel feedstock containing high metal concentrations in admixture with a liquid dispersion comprising soot in a liquid carrier with a free-oxygen containing gas in the presence of a temperature moderator at an autoge-

nous temperature in the range of about 1700° to 3500° F. and a pressure in the range of about 5 to 300 atmospheres in the reaction zone of a first free-flow noncatalytic partial oxidation gas generator to produce a hot, raw stream of synthesis gas comprising H_2, CO, CO_2, particulate carbon, ash, and at least one material from the group H_2O, CH_4, H_2S, COS, H_2 and Ar;

(2) quench cooling and scrubbing with water at least a portion of the hot, raw synthesis gas stream from (1), and separating a partially cleaned synthesis gas stream from a stream of liquid dispersion comprising particulate carbon, water, and ash;

(3) simultaneously with (1) reacting a heavy hydrocarbon fuel feedstock containing high metal concentrations with a free-oxygen containing gas in the presence of a temperature moderator at an autogenous temperature in the range of about 1700° F. to 3500° F. and a pressure in the range of about 5 to 300 atmospheres in the reaction zone of a second free-flow noncatalytic partial oxidation gas generator to produce a hot, raw stream of synthesis gas comprising H_2, CO, CO_2, particulate carbon, ash, and at least one material from the group H_2O, CH_4, H_2S, COS, H_2 and Ar;

(4) splitting the hot, raw synthesis gas stream from (3) into first and second hot-split synthesis gas streams;

(5) cooling in a convection-type gas cooler all of the first hot, split gas stream from (4), scrubbing the partially cooled gas stream with water, and separating a clean product stream of synthesis gas with a low H_2O/dry gas mole ratio from a stream of liquid dispersion of particulate carbon, water, and ash;

(6) quench cooling and scrubbing with water all of the second hot, split gas stream from (4), and separating a partially cleaned synthesis gas stream from a stream of liquid dispersion comprising particulate carbon, water, and ash;

(7) mixing together the partially cleaned synthesis gas streams from (2) and (6), scrubbing the combined streams with water, and separating a clean product stream of synthesis gas with a high H_2O/dry gas mole ratio from a stream of liquid dispersion comprising particulate carbon, water, and ash;

(8) combining the streams of liquid dispersion comprising particulate carbon, water, and ash from (2), (5), (6), and (7); and separating in a soot-recovery zone separate streams of clarified water, ash, and a liquid dispersion comprising soot in a liquid carrier; and

(9) mixing all of the liquid dispersion comprising soot in a liquid carrier from (8) with fresh heavy hydrocarbon fuel feedstock containing high metal concentrations, and introducing said mixture into the first partial oxidation gas generator in (1) as said reactant fuel feedstream.

4,411,671

PRODUCTION OF SYNTHESIS GAS FROM HEAVY HYDROCARBON FUELS CONTAINING HIGH METAL CONCENTRATIONS

Charles P. Marion, Mamaroneck, and Frederick C. Jahnke, Rye, both of N.Y., assignors to Texaco Development Corporation, White Plains, N.Y.

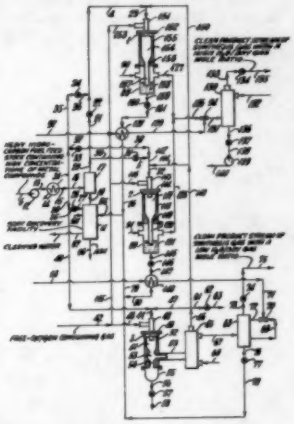
Filed Jun. 7, 1982, Ser. No. 385,743
Int. Cl.³ C10J 3/46
U.S. Cl. 48—197 R **10 Claims**

1. A partial oxidation process comprising:

(1) producing a plurality of separate hot raw streams of synthesis gas comprising H_2, CO, CO_2, particulate carbon, ash, and at least one material from the group H_2O, CH_4, H_2S, COS, N_2 and Ar in a plurality of separate partial oxidation gas generating means by the partial oxidation of heavy liquid hydrocarbon fuel feedstock containing high metal concentrations;

(2) cooling each of the hot raw streams of synthesis gas from (1) in a separate gas cooling zone that is associated with each of said gas generating means; wherein the hot raw synthesis gas stream from at least one gas generating means is cooled in a quench zone with water to produce at least one first clean stream of raw synthesis gas saturated with water and at least one separate stream of liquid dispersion comprising carbon, water and ash; and, wherein the hot raw synthesis gas stream from at least one other gas generating means is cooled in a convection-type gas cooling zone to produce at least one second separate clean stream of raw synthesis gas containing less water than that in said first stream of raw synthesis gas;

(3) scrubbing with water all of the quench cooled synthesis gas from (2) in a scrubbing zone to produce a clean product stream of synthesis gas with a high H_2O/dry gas mole ratio, and a separate stream of liquid dispersion comprising particulate carbon, water, and ash; and in a separate scrubbing zone scrubbing with water all of the synthesis gas from (1) that was cooled in said convection-type gas cooling zone;



(4) introducing the separate streams of liquid dispersion comprising particulate carbon, water and ash from (2) and (3) into a soot-recovery zone to produce separate streams of clarified water, ash and a liquid dispersion comprising soot and water;

(5) recycling separate portions of said clarified water from (4) to the quench zones in (2) and to the separate scrubbing zones in (3); and

(6) mixing the stream of liquid dispersion comprising soot and water from (4) with fresh heavy liquid hydrocarbon fuel feedstock containing high metal concentration and introducing said mixture as the feed to at least one of the gas generating means in (1) that produces a hot raw synthesis gas stream which is cooled with water in a quench zone in (2).

4,411,672

METHOD FOR PRODUCING COMPOSITE OF DIAMOND AND CEMENTED TUNGSTEN CARBIDE

Hiroshi Ishizuka, 19-2, Ebara 6-chome, Shinagawa-ku, Tokyo, Japan

Filed Jul. 21, 1981, Ser. No. 285,619
Claims priority, application Japan, Aug. 14, 1980, 55-112317
Int. Cl.³ B24D 3/02
U.S. Cl. 51—309 **10 Claims**

1. A method for producing a composite of diamond and cemented tungsten carbide, which method comprises:

placing a layer consisting of pulverized diamond adjacent to a sintered tungsten carbide-cobalt support, said pulverized diamond and support being separated from each other by a second metallic material, said second metallic material

having a melting point, when so utilized, below the eutectic point of said sintered tungsten carbide-cobalt support;

heating said assembly to a temperature sufficiently high to cause the second metal to melt but not high enough to effect co-melting of the tungsten carbide and cobalt, said heating being effected in a pressure-temperature region of the carbon phase diagram where diamond is thermodynamically stable, and maintaining said temperature in said temperature-pressure region to join the diamond particles to each other and to join the diamond particles to said sintered tungsten carbide-cobalt support; and

recovering a composite of diamond and cemented tungsten carbide.

4,411,673

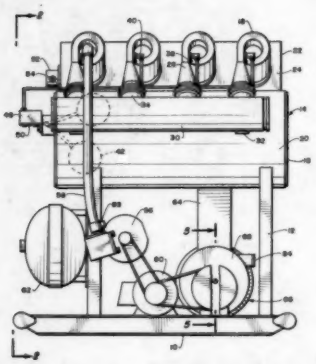
METHOD AND APPARATUS FOR DEGASSING LIQUIDS

Bradley N. Jones, Cerritos; Robert J. Harris, Studio City; Ronald P. Cram, Whittier, and Gene A. Huber, Torrence, all of Calif., assignors to Sweco, Incorporated, Los Angeles, Calif.

Filed Jul. 17, 1980, Ser. No. 169,845

Int. Cl.³ B01D *19/00*

U.S. Cl. 55—41 **22 Claims**



8. A process for degassing liquids, comprising the steps of

creating and maintaining a vacuum in a tank having a central container and a plurality of degassing tubes extending thereto, including pumping gas from the tank directly from a central location in at least one of the tubes;

supplying gas cut liquids through nozzle areas to the ends of the tubes;

directing the flow of gas cut liquids to the tubes to induce helical, thin sheet flow therein;

controllably throttling the volumetric rate of flow of gas cut liquids supplied to the ends of the tubes as a function of the amount of liquid in the central container by reducing the nozzle areas;

discharging the liquid from the tubes into the central container;

accumulating the liquid in the central container to establish a head of liquid; and extracting liquid accumulated in the central container.

4,411,674

CONTINUOUS CLEAN BAG FILTER APPARATUS AND METHOD

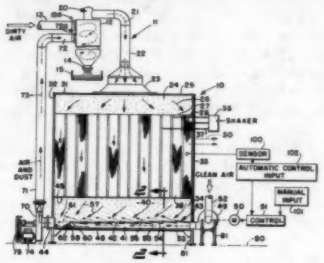
John P. Forgac, Lakewood, Ohio, assignor to Ohio Blow Pipe Co., Cleveland, Ohio

Filed Jun. 2, 1981, Ser. No. 269,631

Int. Cl.³ B01D *46/04, 46/48, 50/00*

U.S. Cl. 55—304 **15 Claims**

1. Continuous clean bag filter apparatus for use with a primary separator disposed relatively upstream thereof, comprising inlet means for receiving a fluid carrier and particulate matter carried thereby vertically disposed bag filter means open at opposite ends pressurized by such fluid carrier for filtering particulate matter from such fluid carrier while at least a substantial quantity of such fluid carrier discharges through a wall portion of said bag filter means, fluid conveyor means for continuously conveying from said bag filtemeans that particulate matter filtered from such fluid carrier, and outlet means for discharging particulate matter from said fluid conveyor means, said fluid conveyor means comprising a controlled fluid flow means for delivering a controlled fluid flow to convey to said outlet mean that particulate matter filtered from such fluid carrier by said bag filter means without interfering with and substantially independently of the passage of such fluid carrier through said wall portion of said bag filter



means, and said outlet means comprising further controlled fluid flow means for producing a further controlled fluid flow to convey that particulate matter received from said fluid conveyor means downstream thereof, and balancing means for balancing said further controlled fluid flow means with respect to the fluid pressure in said bag filter means and the fluid pressure of said fluid conveyor means to provide such further controlled fluid flow that does not interfere substantially with operation of said bag filter means and further comprising collecting means for collecting particulate matter from said bag filter means, and wherein said controlled fluid flow means of said fluid conveyor means comprises blower means for establishing an air flow, plenum means for conducting such air flow proximate said collecting means, and flow directing means for directing at least some of such air flow in said collecting means.

4,411,675

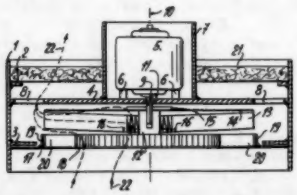
APPARATUS FOR THE PURIFICATION OF GASES

Pierre de Castella, La Vuachere, Monnaz, Switzerland 1111

Filed Aug. 3, 1981, Ser. No. 289,797

Int. Cl.³ B01D *50/00*

U.S. Cl. 55—316 **6 Claims**



1. Apparatus for the filtering of gases, comprising a duct having imperforate walls, an inlet opening adjacent to one end of the duct for a gas to be purified, and an outlet opening at the opposite end of the duct; a filter extending entirely across said outlet opening through which gas to be discharged from the duct must pass; a gas-motivating rotor disposed across said inlet opening and spaced therefrom inwardly of the duct; a wall extending across the duct inwardly thereof from the

rotor, with openings about its peripheral margin for the passage of inflowing gas to the filter, said rotor being formed as a substantially imperforate disc having gas-contacting surfaces adapted to pick up and retain particulate matter carried by the gas; means supported by said wall for rotating the rotor; means disposed peripherally of the inlet opening for substantially preventing flow through the duct peripherally of the inlet opening; and means for providing an aerodynamic block against backflow of gas from the interior of the duct between the filter and the rotor, said means for preventing flow through the duct comprising an imperforate shelf, and said means for producing an aerodynamic block defining the inlet opening and comprising a replaceable ring of material supported by said shelf and having surface area for the removal of particulate matter from the inflowing gas to be filtered, said ring of material being a strip folded transversely of its length to provide flutes.

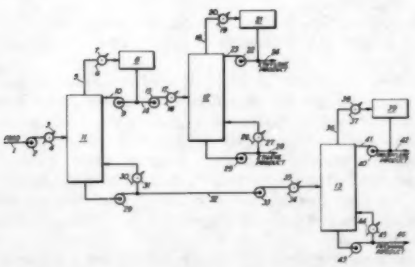
5. Apparatus for the filtering of gases, comprising a duct having imperforate walls, an inlet opening adjacent to one end of the duct for a gas to be purified, and an outlet opening at the opposite end of the duct; a filter extending entirely across said outlet opening through which gas to be discharged from the duct must pass; a gas-motivating rotor disposed across said inlet opening and spaced therefrom inwardly of the duct; a wall extending across the duct inwardly thereof from the rotor, with openings about its peripheral margin for the passage of inflowing gas to the filter, said rotor being formed as a substantially imperforate disc having gas-contacting surfaces adapted to pick up and retain particulate matter carried by the gas; means supported by said wall for rotating the rotor; means disposed peripherally of the inlet opening for substantially preventing flow through the duct peripherally of the inlet opening; and means for providing an aerodynamic block against backflow of gas from the interior of the duct between the filter and the rotor, said duct being in the form of a hood for positioning above a source of gas to be filtered, said means for preventing flow through the duct comprising an imperforate shelf, and said means for providing an aerodynamic block defining the inlet opening and comprising a shelf extension having its inner peripheral margin sloping outwardly of the duct and toward the axis of the inlet opening at an angle of approximately thirty degrees.

4,411,676

FRACTIONAL DISTILLATION OF C_2/C_3 HYDROCARBONS AT OPTIMUM PRESSURES

Daniel W. Tedder, Marietta, Ga., assignor to Georgia Tech Research Institute, Atlanta, Ga.

Division of Ser. No. 299,623, Sep. 4, 1981, abandoned. This application Apr. 14, 1982, Ser. No. 368,385
Int. Cl.³ F25J 3/02
U.S. Cl. 62—24 **3 Claims**



1. Method of optimizing the expense of the recovery of C_2/C_3 hydrocarbons from a fluid mixture consisting essentially of ethane, ethylene propane and propylene through fractional distillation comprising:

(a) operating a system of distillation towers in a distillation system in which each tower receives a single feed and produces two effluents and wherein certain of the towers has a reboiler wherein the pressure of each tower is within ±15 psia of the pressure, calculated from the formulae:

$$\log_e (P^*) = 2.677 - \frac{309.4}{T_{FB}} + \frac{1147.6}{T_{\phi B}} + \frac{1087.4}{T_{BD}}$$

and wherein:

P^* = the pressure of each tower in psia

T_{FB} = tower feed mixture bubble point temperature (°R) evaluated at 485 psia

$T_{\phi B}$ = tower overhead product mixture bubble point temperature (°R) evaluated at 485 psia

T_{BD} = tower bottom product mixture dew point temperature (°R) evaluated at 485 psia

(b) circulating cooling water which has been heated during a heat exchange cooling operation by heat from one of said towers to a temperature of from 80° F. to 130° F., to said reboiler and back to said heat exchanger;

(c) feeding at least a portion of said fluid mixture to the internals of the other of said towers;

(d) discharging said recovering the effluent distillate product from the top of said internals; and

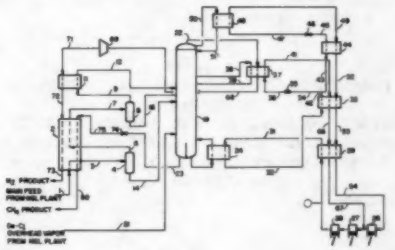
(e) discharging the effluent bottom product from the bottom of said internals.

4,411,677

NITROGEN REJECTION FROM NATURAL GAS

James W. Pervier, West Chester; Harvey L. Vines, Emmaus; Vincent Marano, III, Macungie, and Michael A. Patterson, Whitehall, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 10, 1982, Ser. No. 376,365
Int. Cl.³ F25J 3/02
U.S. Cl. 62—25 **8 Claims**



1. A process for separating nitrogen from a high pressure feed containing natural gas and nitrogen over a wide concentration range of 5–85% by volume in a single distillation column to form high pressure product streams of nitrogen and of natural gas comprising:

(a) cooling said high pressure feed against high pressure product streams to separate multiple feeds to said column and distilling said cooled feeds in said single distillation column to form a high pressure overhead vapor rich in nitrogen and a high pressure bottoms liquid rich in natural gas hydrocarbons;

(b) condensing a head vapor of an upper section of said column by heat exchange with a first closed loop refrigerant to provide reflux to said column;

(c) condensing an intermediate vapor of an intermediate section of said column by heat exchange with a second closed loop refrigerant and by heat exchange with said high pressure overhead vapor rich in nitrogen without expansion to provide an intermediate reflux to said column, wherein said intermediate section vapor condensing

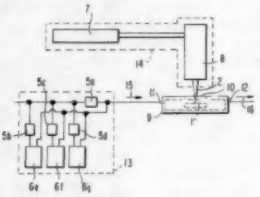
attributable to heat exchange with said high pressure nitrogen overhead increases with increasing nitrogen concentration in said feed.

4,411,678

METHOD FOR FABRICATING AN OPTICAL WAVEGUIDE ON A PLANAR GLASS SUBSTRATE

Motohiro Arai, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Mar. 31, 1982, Ser. No. 364,048
Claims priority, application Japan, Apr. 2, 1981, 56-48411
Int. Cl.³ C03B *19/00*; C03C *17/02*
U.S. Cl. 65—3.12 **4 Claims**



1. A method of fabricating an optical waveguide comprising the steps of:

installing a planar glass substrate within a reaction vessel;

supplying glass raw materials into the reaction vessel;

irradiating a collimated laser beam on a defined region of the planar glass substrate to enhance the temperature high enough for the thermal reaction of the glass raw materials to form on the defined region a transparent glass layer having an index of refraction greater than that of the planar glass substrate, but said temperature being lower than the softening point of the planar glass substrate; and

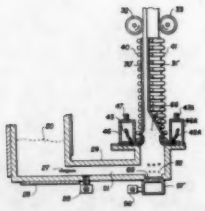
repeatedly scanning the glass substrate with the laser beam to accumulate a plurality of transparent glass layers which form an optical waveguide.

4,411,679

METHOD OF PRODUCING FOAMED CONSTRUCTION MATERIALS

Robert S. Pelton, 1400 S. Joyce St., Arlington, Va. 22202

Continuation-in-part of Ser. No. 128,887, Mar. 10, 1980, Pat. No. 4,314,835. This application Feb. 8, 1982, Ser. No. 346,590
Int. Cl.³ C03B *19/08*
U.S. Cl. 65—22 **12 Claims**



1. The method of making a strong, light-weight weight-bearing structural member with insulating properties having integrally formed exterior surface structure withstanding atmospheric erosion, comprising the steps of,

melting a mass of a refractory material in the group consisting of glass, plastic, ceramic, aluminum and zinc,

introducing into the molten mass a plurality of hollow bodies having shells formed of materials having a melting point higher than that of the molten mass in the group consisting of glass refractory material and titanium thereabout that sustain their shape in the molten mass to form thereby a foamed light-weight product comprising an intermixture of the refractory material and the hollow bodies, and

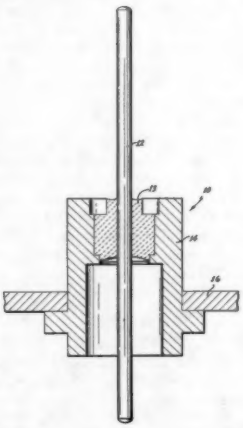
forming said molten mass into a frozen structural member of predetermined shape.

4,411,680

CERAMIC SEAL BETWEEN SPACED MEMBERS SUCH AS A TERMINAL PIN AND A FERRULE

James C. Kyle, 24335 Via San Clemente, Mission Viejo, Calif. 92675, assignor to James C. Kyle, Roseburg, Oreg.

Division of Ser. No. 836,659, Sep. 26, 1977, Pat. No. 4,352,951. This application Apr. 27, 1982, Ser. No. 372,118
Int. Cl.³ C03C *27/04, 29/00*; C03B *32/00*
U.S. Cl. 65—33 **23 Claims**



1. A method of providing a hermetic seal between a first member which is a steel and a second member, including the following steps:

providing a mixture of acid and alkali oxides, at least one of the oxides in the mixture having properties of forming a glass,

smelting the mixture at a first elevated temperature above the melting point of the oxides for an extended period of time to melt the oxides and to provide a partially amorphous and partially crystalline state in the mixture,

quenching the smelted fixture in water to produce a frit,

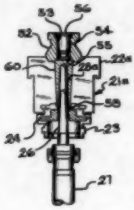
fusing the fritted mixture to the first and second members in an oxygen atmosphere at a second elevated temperature below the first elevated temperature for a minimal period of time, and

rapidly cooling the fused mixture and the first and second members directly to air, thereby providing said first and said second members sealed together by a fused vitreous mixture having a partially crystalline and partially amorphous structure, with the relative amount of the crystalline structure being greater at positions adjacent the first member than at positions displaced from the first member.

4,411,681
METHOD AND APPARATUS FOR MANUFACTURING GLASS BOTTLES

John D. Northup, Toledo, Ohio, assignor to Ruth B. Northup; John D. Northup, Jr.; Nancy N. Lehrkind and Mary E. Northup, all of Toledo, Ohio

Filed Jan. 14, 1983, Ser. No. 458,169
Int. Cl.³ C036 *11/10*
U.S. Cl. 65—77 9 Claims



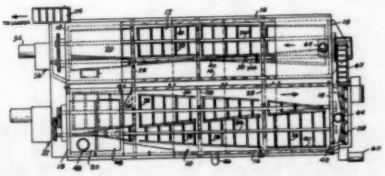
1. The method of forming glass parisons from which glass containers are formed in a machine having at least one blank mold and baffle means, the mold and the baffle means defining a cavity and having a cavity plunger in line with the cavity, the method comprising the steps of:

moving the plunger into the cavity to its completely extended position, introducing a measured gob of molten glass to a loading position above the blank cavity, moving such gob from the loading position to a pressing position within the blank cavity, applying air pressure in excess of 80 p.s.i.g. to create a fluid pressure on the molten glass gob pressing it into conformity with the mold and extended plunger, retracting the cavity plunger; expanding the plunger cavity; cooling the parison; and separating the parison from the baffle means and the blank mold.

4,411,682
PROCESS AND APPARATUS FOR PRODUCING COMPOST

Joseph H. Brill, 4825 W. Sanilac, Snover, Mich. 48472

PCT No. PCT/US80/00069, § 371 Date Sep. 14, 1981, § 102(e) Date Sep. 8, 1981, PCT Pub. No. WO81/02011, PCT Pub. Date Jul. 23, 1981
PCT Filed Jan. 14, 1980, Ser. No. 304,991
Int. Cl.³ C05F *11/08*
U.S. Cl. 71—9 10 Claims



1. The method of producing a fermented product in a horizontally elongated chamber having a pair of rotatable shafts therein journalled on generally horizontally extending parallel axes which are spaced apart in a horizontal plane, each shaft having at least one row of radially projecting fingers thereon spaced along the axis of each shaft, said fingers being located and dimensioned relative to said chamber and the spacing of said shafts so that substantially the entire contents of the chamber are agitated by the churning and lifting action of the fingers when the shafts are rotated, which comprises:

(a) loading into said chamber a batch of organic matter containing bacteria, said batch being of a predetermined volume such as to only partially fill said chamber and thereby provide a substantial air space throughout the length of the chamber above the level of the batch mixture therein;

(b) after loading, isolating said chamber from the surrounding atmosphere except for the hereinafter mentioned air flow;

(c) rotating the two shafts in opposite directions so that the fingers thereon travel through the mixture in a direction which tends to displace it from the opposite longitudinal sides of the chamber laterally inwardly and upwardly toward the longitudinal central portion of the chamber;

(d) rotating the shaft at a rate such that the mixture is progressively agitated by the circumferentially successive rows of fingers on each shaft about once every three minutes but not more than about once every one-half minute to thereby cause substantially all portions of the mixture to progressively come into intimate and relatively prolonged contact with the hereinafter mentioned air;

(e) while said shafts are rotating, conducting fresh air over the mixture through the entire length of said chamber at a rate between about ½ to 2¼ cubic feet per minute per hundred cubic feet of the batch mixture in the chamber thereby causing fermentation of the mixture to proceed at such rate as to raise the temperature of the mixture to about 210 degrees Fahrenheit within a period of not more than about 18 hours without the application of external heat;

(f) continuing the flow of air and rotation of said shafts at said rates while and after the temperature thereof levels off at said elevated value to cool the moist fermented product so formed to relatively low temperature approaching room temperature;

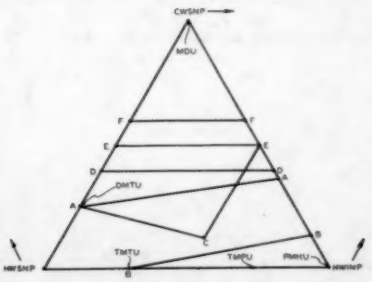
(g) drying the cooled moist product so formed using drying air of a temperature not exceeding 120 degrees Fahrenheit to reduce its moisture content to a maximum of not more than about 50% by weight within a reasonably short time after the aerobic reaction is completed and before substantial anaerobic decomposition of the fermented product occurs; and

(h) maintaining substantially the entire batch of said product in said dried condition until it is ready for use.

4,411,683
PROCESS OF PREPARING SOLID CONTROLLED RELEASE FERTILIZER COMPOSITION

Harvey M. Goertz, Marysville, Ohio, assignor to The O. M. Scott & Sons Company, Marysville, Ohio

Filed Jul. 30, 1981, Ser. No. 288,456
Int. Cl.³ C05C *9/02*
U.S. Cl. 71—28 14 Claims



1. A process of preparing a solid controlled release urea-formaldehyde fertilizer composition comprising

preparing an aqueous mixture of urea, formaldehyde and ammonia, the molar ratio of urea to formaldehyde ranging

from 1 to 3, the molar ratio of ammonia to formaldehyde ranging from 0.05 to 1.00,

heating said mixture to a temperature of from 140° to 190° F. at an alkaline pH, the heating being stopped prior to the formation methylene urea polymers, said reaction producing a mixture of methylol ureas and an ammonia intermediate reaction product,

acidifying said reaction mixture with from 0.1 to 8% by weight of the mixture of an acid to initiate methylene urea polymerization and

heating said reaction mixture to a temperature of from 180° to 320° F. for a time sufficient to complete said methylene urea polymerization and dry said reaction product, the majority of polymeric nitrogen present in said product consisting of short chain methylene urea polymers selected from the group consisting of methylene diurea, dimethylene triurea and mixtures thereof.

4,411,684

AUXIN COMPOSITIONS OF N-PHENYL AND N-CHLORO PHENYL INDOLYL-3-ALKYLENE AMIDES AND THEIR USE AS AUXIN GROWTH REGULATORS

David A. Boyles; Jack R. Gaines, both of Rapid City, S. Dak., and Bruce E. Haissig, Rhinelander, Wis., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Apr. 12, 1982, Ser. No. 367,639
Int. Cl.³ A01N *43/38*; C07D *209/18*
U.S. Cl. 71—77 **4 Claims**

1. A synthetic auxin composition for stimulating adventitious root formation in difficult-root cuttings, comprising an amount sufficient to simulate adventitious root formation of a compound or mixture of compounds selected from the group consisting of phenyl and chlorophenyl indole-3-lower alkylene amides wherein the alkylene amide group has up to 4 carbons; and a volatile or inert non-toxic carrier.

4. A method of stimulating adventitious root formation of plant cuttings comprising

contacting the stem of a plant cutting with a phenyl indole-3-lower alkylene amide wherein the amide group has up to 4 carbon atoms, or a mixture thereof; and

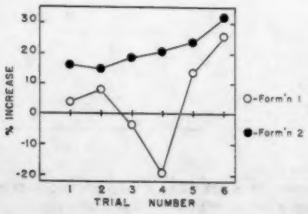
maintaining said cutting in an environment for developing roots on the stem of said cutting until the roots develop to an extent that said cutting is suitable for transplanting.

4,411,685

1-TRIACONTANOL PLANT GROWTH STIMULATOR FORMULATIONS

Andrew J. Welebir, Falls Church, Va., assignor to Biochemical Research Corporation, Falls Church, Va.

Continuation-in-part of Ser. No. 146,005, May 2, 1980, Pat. No. 4,333,758, which is a continuation-in-part of Ser. No. 47,696, Jun. 12, 1979, abandoned. This application Oct. 30, 1980, Ser. No. 202,705
The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.
Int. Cl.³ A01N *59/00*
U.S. Cl. 71—84 **20 Claims**



1. A plant growth stimulator formulation, consisting essentially of an effective plant growth-stimulating amount of 1-triacontanol; a water-soluble polar organic solvent in which 1-triacontanol is soluble; metal ions having a valence of +2 through +5, inclusive; an auxin; and water, said metal ions and said auxin being present in an amount effective to assist the 1-triacontanol in stimulating plant growth.

4,411,686

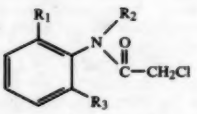
DIHALOPROPYL ESTER ANTIDOTES FOR ACETANILIDE HERBICIDES

Laddie L. Green, San Jose, and Kent E. Matsumoto, Kensington, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Feb. 17, 1981, Ser. No. 235,342
Int. Cl.³ A01N *43/00*
U.S. Cl. 71—88 **9 Claims**

1. A composition comprising:

(a) an herbicidally effective amount of an acetanilide compound of the formula

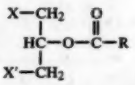


in which

R_1 and R_3 are independently each alkyl having 1–2 carbon atoms, inclusive; and

R_2 is alkoxyalkyl having 1–4 carbon atoms, inclusive; and

(b) a non-phytotoxic antidotally effective amount of a compound of the formula



in which

X and X' are halogens, independently selected from the group consisting of chlorine, bromine and iodine; and

R is dioxane-substituted alkoxy carbonyl wherein the alkoxy group has 1–4 carbon atoms, inclusive.

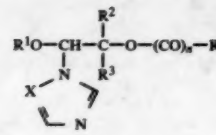
4,411,687

α-AZOLYL-GLYCOL DERIVATIVES, AS FUNGICIDES AND PLANT GROWTH REGULATORS

Bernd Zeeh, Ludwigshafen; Norbert Goetz, Worms; Eberhard Ammermann, Ludwigshafen, and Ernst-Heinrich Pommer, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 160,309, Jun. 17, 1980, abandoned. This application Sep. 18, 1981, Ser. No. 303,572
Claims priority, application Fed. Rep. of Germany, Jun. 29, 1979, 2926280
Int. Cl.³ A01N *43/50, 43/64*; C07D *233/60, 249/08*
U.S. Cl. 71—76 **9 Claims**

1. A process for reducing the growth height of plants which comprises: applying to said plants or to the habitat of such plants an effective amount of a composition comprising a solid or liquid carrier and a compound of the formula I



I

where R^1 is C_{1-4}-alkyl,
R^2 is C_{1-6}-alkyl or unsubstituted or chlorine-substituted phenyl,
R^3 is hydrogen, C_{1-6}-alkyl, C_{2-6}-alkenyl, C_{2-6}-alkynyl or unsubstituted or chlorine-substituted benzyl,
R^4 is methyl, ethyl, propenyl, propynyl, unsubstituted or chlorine-substituted benzyl or, where n = 1, may also be unsubstituted or chlorine-, trifluoromethyl- or nitro-substituted phenyl,
X is CH or N and
n is 0 or 1 or a plant-tolerated salt or metal complex thereof.

4,411,688

SUBSTITUTED 2-IMINO-1,3-DITHIO AND 1,3-OXATHIO HETEROCYCLIC COMPOUNDS AS HERBICIDAL ANTIDOTES

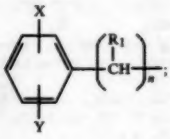
Frederic G. Bollinger, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 170,505, Jul. 21, 1980, Pat. No. 4,321,082, which is a division of Ser. No. 960,987, Nov. 15, 1978, Pat. No. 4,231,783. This application Jan. 21, 1982, Ser. No. 341,432
Int. Cl.³ A01N *43/02, 37/18*
U.S. Cl. 71—90 **39 Claims**

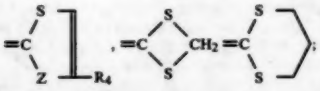
1. A method of reducing injury to rice sorghum and wheat due to the application thereto of alachlor and butachlor which comprises applying to the plant locus a safening effective amount of a compound having the formula

R-N=A

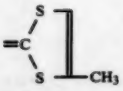
or an agriculturally acceptable acid addition salt thereof, wherein R is hydrogen, or



R_1 is hydrogen or lower alkyl; X and Y independently equal hydrogen, lower alkyl, lower alkoxy or Cl; n is 0, 1, 2 or 3; A is



R_4 is hydrogen, methyl or phenyl; Z is oxygen or sulfur; provided that when n is 1 and A is



R_1 cannot equal n-propyl or isobutyl.

4,411,689

SUBSTITUTED 2-IMINO-1,3-DITHIO AND 1,3-OXATHIO HETEROCYCLIC COMPOUNDS AS HERBICIDAL ANTIDOTES

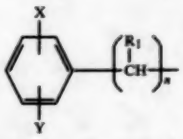
Frederic G. Bollinger, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 170,505, Jul. 21, 1980, Pat. No. 4,321,082, which is a division of Ser. No. 960,987, Nov. 15, 1978, Pat. No. 4,231,783. This application Jan. 21, 1982, Ser. No. 341,434
Int. Cl.³ A01N *43/02, 37/00*
U.S. Cl. 71—90 **9 Claims**

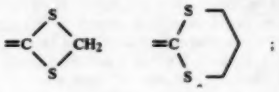
1. A method of reducing injury to rice, sorghum and wheat due to the application thereto of triallate which comprises applying to the plant locus a safening effective amount of a compound having the formula

R-N=A

or an agriculturally acceptable acid addition salt thereof, wherein R is hydrogen, or



R_1 is hydrogen or lower alkyl; X and Y independently equal hydrogen, lower alkyl, lower alkoxy or Cl; n is 0, 1, 2 or 3; A is



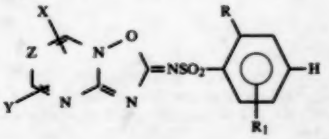
4,411,690

FUSED [1,2,4]OXADIAZOLYLIDENEBENZENESULFONAMIDES AND THEIR USE AS HERBICIDES AND PLANT GROWTH REGULANTS

Chi-Ping Tseng, Wilmington, Del., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Continuation-in-part of Ser. No. 228,705, Jan. 26, 1981, abandoned. This application Dec. 3, 1981, Ser. No. 326,267
Int. Cl.³ A01N *43/90*; C07D *498/04*
U.S. Cl. 71—92 **33 Claims**

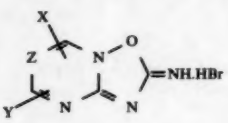
1. A compound of the formula:



where
R is C_1–C_4 alkyl, C_1–C_4 alkoxy, F, Cl, Br, NO_2, COR_4, SO_2R_5, $SO_2NR_6R_7$, $SO_2OCH_2CF_3$, $SO_2OCH_2CCl_3$, $SO_2N(OCH_3)(CH_3)$, BR_8, OSO_2R_9 or CH_2P;
R_1 is H, F, Cl, Br, CF_3, NO_2, C_1–C_4 alkyl or C_1–C_4 alkoxy;
R_4 is C_1–C_6 alkoxy, C_3–C_6 alkenyloxy, C_2–C_6 haloalkoxy substituted with 1–3 atoms selected from F, Cl, or Br, C_5–C_6 cycloalkoxy, $—O(CH_2CH_2O)_nR_{10}$ or $OCH_2CH_2CH_2OR_{10}$;
n is 1 or 2;
R_5 is C_1–C_4 alkyl;

R_6 and R_7 are independently C_1–C_4 alkyl, provided the total number of carbon atoms of R_6 and R_7 does not exceed 5;
B is O or SO_2;
R_8 is CHF_2, CF_3, CH_2CF_3, CF_2CHFG where G is F, Cl, Br or CF_3;
R_9 is C_1–C_4 alkyl or C_1–C_4 alkyl substituted with 1–3 atoms selected from F, Cl or Br;
P is C_1–C_4 alkoxy, C_3–C_4 alkenyloxy or SO_2R_5;
R_{10} is CH_3 or CH_3CH_2;
X is CH_3, CH_3CH_2, CH_3O or CH_3CH_2O;
Y is H, Cl, CF_3, C_1–C_4 alkyl, C_1–C_4 alkoxy, CH_2OCH_3, $CH_2OCH_2CH_3$, $CH_2CH_2OCH_3$ or $CH_2CH_2OCH_2CH_3$; and
Z is CH and their agriculturally suitable salts.

11. A compound of the formula:



wherein
X is CH_3, CH_3CH_2, CH_3O or CH_3CH_2O;
Y is H, Cl, CF_3, C_1–C_4 alkyl, C_1–C_4 alkoxy, CH_2OCH_3, $CH_2OCH_2CH_3$, $CH_2CH_2OCH_3$ or $CH_2CH_2OCH_2CH_3$; and
Z is CH.

14. A composition suitable for controlling the growth of undesired vegetation consisting essentially of an effective amount of a compound of claim 1 and at least one of a surfactant and a solid or liquid inert diluent.

4,411,691

1-SUBSTITUTED PHENYL-PYRIDAZONE HERBICIDES

Wolfgang Rohr, Mannheim; Hanspeter Hansen, Ludwigshafen; Bruno Wuerzer, Limburgerhof, and Heinz-Guenter Ceser, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 194,439, Oct. 6, 1980, abandoned, which is a continuation of Ser. No. 7,006, Jan. 26, 1979, abandoned. This application Feb. 1, 1982, Ser. No. 344,612
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1978, 2808193
Int. Cl.³ A01N *43/58*; **C07D** *237/16, 237/14*
U.S. Cl. 71—92 **2 Claims**

1. A substituted pyridazone selected from the group consisting of 1-(3-tetrafluoroethoxyphenyl)-4,5-dimethoxypyridazone-6 and 1-(3-monobromotrifluoroethoxyphenyl)-4,5-dimethoxypyridazone.-6

2. A process for combating the growth of unwanted plants wherein the soil or the plants are treated with a substituted pyridazone selected from the group consisting of 1-(3-tetrafluoroethoxyphenyl)-4,5-dimethoxypyridazone-6 and 1-(3-monobromotrifluoroethoxyphenyl)-4,5-dimethoxypyridazone-6.

4,411,692

FLOWABLE HERBICIDES

Francis J. LeClair, Webster Groves, and John M. Surgant, Clayton, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 26, 1981, Ser. No. 247,679
The portion of the term of this patent subsequent to Feb. 1, 2000, has been disclaimed.
Int. Cl.³ A01N *25/02, 25/00*
U.S. Cl. 71—93 **8 Claims**

1. A water-based, flowable herbicide composition which comprises by weight:
(a) 28.0% to 35.0% 2-chloro-N-isopropylacetanilide herbicide;
(b) 7.0% to 16.0% of an s-triazine selected from the group consisting of atrazine, simazine and propazine;
(c) 2.0% to 6.0% of a hydrated amorphous silicon dioxide;
(d) 2.0% to 6.0% of a polyoxypropylene/polyoxyethylene block-copolymer;
(e) 0.5% to 2.0% of a taurate surfactant;
(f) 0.5% to 2.0% of a hydrated aluminum silicate;
(g) 0.5% to 1.0% of a flocculent;
(h) 5.0% to 10.0% of an anti-freeze agent;
(i) 0.5% to 2.0% of a silicon antifoaming agent; and
(j) balance being water; the solid components of said composition having a particle size of no greater than 25 microns.

4,411,693

FLOWABLE HERBICIDES

Francis J. LeClair, Webster Groves, and John M. Surgant, Clayton, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Mar. 26, 1981, Ser. No. 247,680
The portion of the term of this patent subsequent to Feb. 1, 2000, has been disclaimed.
Int. Cl.³ A01N *25/02, 25/00*
U.S. Cl. 71—118 **7 Claims**

1. A water-based, flowable herbicide composition which comprises by weight:
(a) 38.0% to 45.0% 2-chloro-N-isopropylacetanilide herbicide;
(b) 2.0% to 6.0% of a hydrated amorphous silicon dioxide;
(c) 2.0% to 6.0% of a polyoxypropylene/polyoxyethylene block-copolymer;
(d) 0.5% to 2.0% of a taurate surfactant;
(e) 0.5% to 2.0% of a hydrated aluminum silicate;
(f) 0.5% to 1.0% of a flocculent;
(g) 5.0% to 10.0% of an anti-freeze agent;
(h) 0.5% to 2.0% of a silicon antifoaming agent; and
(i) balance being water;
the solid components of said composition having a particle size of no greater than 25 microns.

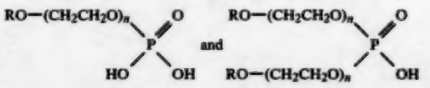
4,411,694

EMULSIFIABLE CONCENTRATES OF 2-CHLORO-N-ISOPROPYL-2',3'-DIMETHYLACETANILIDE WITH IMPROVED RESISTANCE TO CRYSTALLIZATION AND PROCESS FOR PREPARING THE SAME

Frank H. Smith, Jr., Titusville, N.J., and Pradip K. Mookerjee, Martinez, Calif., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 156,010, Jun. 3, 1980, abandoned. This application Nov. 23, 1981, Ser. No. 324,221
Int. Cl.³ A01N *57/00*
U.S. Cl. 71—118 **4 Claims**

1. An emulsifiable liquid composition which comprises in admixture: 50% to 70% by weight of 2-chloro-N-isopropyl-2',3'-dimethylacetanilide, 23.5% to 30% by weight of phenol, with the proviso that the molar ratio of 2-chloro-N-isopropyl-2',3'-dimethylacetanilide to phenol be about 1:0.8 to 1:1.1, 2% to 15% by weight of a pair of surfactants in a 1:1 to 4:1 weight ratio, and wherein the first surfactant is a mixture of dodecylbenzene sulfonate and ethoxylated nonylphenol, and the second surfactant is a mixture of mono and diesters of orthophosphoric acid represented by the formulas:



wherein R is C_8–C_{20} alkyl or C_8–C_{20} alkylphenyl and n is an integer of 6 to 10; and the composition is totaled to 100% with an inert aromatic solvent.

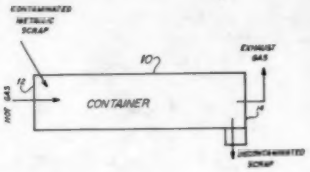
4,411,695
METALLIC SCRAP DECONTAMINATION PROCESS

Noel H. Twyman, Canyon Lake, Calif., assignor to Apros Corporation, Tustin, Calif.

Continuation-in-part of Ser. No. 771,846, Feb. 25, 1977, Pat. No. 4,264,060. This application Apr. 16, 1979, Ser. No. 30,151

Int. Cl.³ C22B 1/02

U.S. Cl. 75—44 S **18 Claims**



1. A process for decontamination of contaminated metallic scrap which comprises:

passing an oxygen bearing hot gas through the interior of a container having an inlet end and an exit end, said hot gas entering said container at said inlet end and exiting said container at said exit end;

locating said contaminated scrap within the interior of said container at said inlet end;

concurrently

(a) moving said scrap from said inlet to said exit end of said container, (b) mixing and agitating said scrap within the interior of said container, and (c) contacting said scrap with said hot gas stream under conditions essentially incapable of sustaining flaming within the interior of said container;

said contacting said scrap with said hot gas transferring heat from said hot gas stream to said scrap lowering the temperature of said hot gas stream, while concurrently raising the temperature of said scrap

(a) through a first temperature phase wherein low boiling hydrocarbons and water are volatilized and decomposed into gases which are diffused into said hot gas stream and (b) to a second temperature phase wherein high boiling contaminants are volatilized or decomposed and other contaminants which are essentially capable of being oxidized below 1200° F. but which are not volatilized, are oxidized and (c) maintaining said scrap within the second temperature phase for a time period sufficient to insure complete removal of said contaminants;

discharging said decontaminated scrap from said container.

4,411,696
STEELMAKING PROCESS WITH SEPARATE REFINING STEPS

Hiroyuki Nakashima, Kisarazu; Morihiro Sumida, and Hiroki Goto, both of Kimitsu, all of Japan, assignors to Nippon Steel Corporation, Japan

Division of Ser. No. 243,451, Mar. 13, 1981. This application Mar. 29, 1982, Ser. No. 362,839

Claims priority, application Japan, Mar. 21, 1980, 55-34693; Jan. 23, 1981, 56-8855

Int. Cl.³ C21C 7/02

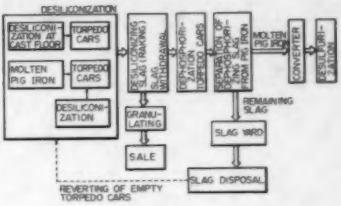
U.S. Cl. 75—51 **2 Claims**

1. A method for desiliconizing, dephosphorizing and decarburizing molten pig iron, wherein molten pig iron from a blast furnace is first desiliconized, then dephosphorized and the decarburized, which comprises:

(a) desiliconizing molten pig iron to an Si content of 0.20% or less;

(b) dephosphorizing said desiliconized molten pig iron to a P content of 0.040% or less in a vessel while forming a dephosphorization slag and a body of dephosphorized molten pig iron,

(c) withdrawing said dephosphorized molten pig iron from said vessel, whereby dephosphorization slag remains in said vessel and adding new molten pig iron from a blast



furnace to said vessel containing said dephosphorization slag and then desiliconizing said molten pig iron in said vessel.

4,411,697
METAL REFINING PROCESSES

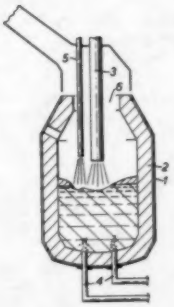
Gene D. Spenceley, Stokesley, and Brian C. Welbourn, Whitby, both of England, assignors to British Steel Corporation, London, England

Filed Jun. 14, 1982, Ser. No. 388,428

Claims priority, application United Kingdom, Jun. 19, 1981, 8118962

Int. Cl.³ C21C 5/32, 5/34

U.S. Cl. 75—60 **12 Claims**



1. A process for refining steel comprising the steps of blowing a refining gas at the upper surface of the melt contained in a refining vessel by means of an overhead lance; injecting a stirring or processing gas directly into the vessel below the surface of the melt therein; and introducing solid carbonaceous material from about onto or through the upper surface of the melt in the refining vessel.

4,411,698
PROCESS FOR RECLAIMATION OF HIGH PURITY SELENIUM, TELLURTUM, AND ARSENIC FROM SCRAP ALLOYS

Santokh S. Badesha, Ontario, N.Y., assignor to Xerox Corporation, Stamford, Conn.

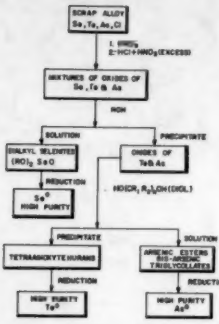
Filed Aug. 2, 1982, Ser. No. 404,258

Int. Cl.³ C01B 19/02; C22B 3/00

U.S. Cl. 75—121 **20 Claims**

1. A process for obtaining selenium, tellurium and arsenic in high purity, which comprises providing a source material containing selenium, tellurium and arsenic, treating the source material with a strong acid, reacting the resulting product with an alcohol wherein a solution of a selenium ester is formed, and a precipitate of the oxides of the tellurium and arsenic results,

subjecting the selenium ester solution subsequent to distillation to a reduction reaction, resulting in the formation of substantially pure selenium, reacting the tellurium and arsenic oxides



percipitate with a diol, resulting in the formation of a precipitate of a tellurium ester, and a solution of an arsenic ester, followed by subjecting, subsequent to purification the tellurium ester and the arsenic ester to reduction reactions.

4,411,699

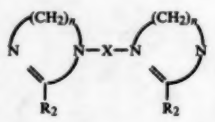
DESENSITIZER COMPOSITIONS

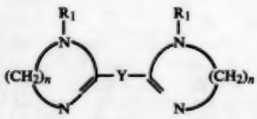
Ken Iwakura; Nobuyoshi Sekikawa, both of Minami-ashigara, and Akio Miyamoto, Fujinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 16, 1981, Ser. No. 311,812
Claims priority, application Japan, Oct. 22, 1980, 55-148046
Int. Cl.³ C09D 11/00
U.S. Cl. 106—23 **6 Claims**

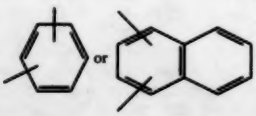
1. A desensitizer composition comprising:

(a) a bis-compound of an amidine derivative represented by the formula (III) or (IV):

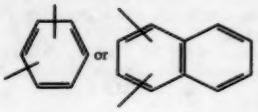

(III)


(IV)

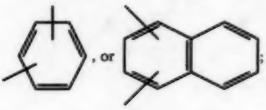
wherein R_1 represents a hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 20 carbon atoms, or an aryl group having 6 to 20 carbon atoms; R_2 represents a hydrogen atom, a substituted or unsubstituted alkyl group having 1 to 20 carbon atoms, an aryl group having 6 to 20 carbon atoms, an amino group, or an alkylthio group; X represents $-(CH_2)_k-A-(CH_2)_l-B-(CH_2)_m-$, $-CH_2-$,



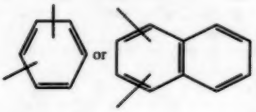
wherein A and B each is >O, >NH, >CH_2,



and k, l, and m each is 0 or an integer of 1 to 4; Y represents $-(CH_2)_k-A-(CH_2)_l-B-(CH_2)_m-$, $-CH_2-$, $-NH(CH_2)_j-NH-$,



wherein A and B each is >O, >NH, >CH_2,



k, l and m each is 0 or an integer of 1 to 4; and j is an inter of 1 to 12; and wherein the ring-forming methylene group may be substituted with an alkyl group having 1 to 4 carbon atoms or a phenyl group;

(b) a synthetic or natural high molecular weight compound as a binder; and

(c) a pigment.

4,411,700

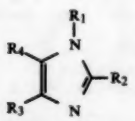
DESENSITIZER COMPOSITIONS

Nobuyoshi Sekikawa; Ken Iwakura, both of Minami-ashigara; Akio Miyamoto, and Masato Satomura, both of Fujinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 16, 1981, Ser. No. 311,819
Claims priority, application Japan, Oct. 17, 1980, 55/145345
Int. Cl.³ C09D 11/00
U.S. Cl. 106—23 **5 Claims**

1. A desensitizer composition comprising:

(a) an imidazole derivative represented by following general formula (I) or a bis-compound thereof as the desensitizer:


(I)

wherein R_1 represents a hydrogen atom, an alkyl group having 1 to 20 carbon atoms, or an aryl group having 6 to 20 carbon atoms; R_2 represents a hydrogen atom, an alkyl group having 1 to 20 carbon atoms, an aryl group having 6 to 20 carbon atoms, an amino group, or an alkylthio group having 1 to 20 carbon atoms; and R_3 and R_4, which may be the same or different, each represents a hydrogen atom, an alkyl group having 1 to 4 carbon atoms, or an aryl group having 6 to 20 carbon atoms; and R_1, R_2, R_3 and R_4 each may be substituted;

(b) a natural or synthetic high molecular weight compound useful as a binder; and

(c) a pigment.

4,411,701

WATERPROOF GYPSUM MOLDED PRODUCT

Masumi Saito, Kobe; Eiichi Hirai, Takarazuka, and Masao Endo, Nishinomiya, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Kurashiki, Japan

Continuation-in-part of Ser. No. 191,824, Sep. 26, 1980, Pat. No. 4,341,560. This application Jan. 29, 1982, Ser. No. 344,171
Claims priority, application Japan, Oct. 2, 1979, 54-127488
The portion of the term of this patent subsequent to Jul. 27, 1997, has been disclaimed.
Int. Cl.³ C04B 11/14
U.S. Cl. 106—87 9 Claims

1. A molded waterproof gypsum product formed of a mixture of hemihydrate gypsum with 0.25 to 1 part by weight of an alkali metal alkylsiliconate or phenylsiliconate and 0.07 to 3.5 parts by weight (as CaO) of a strengthening additive selected from calcium oxide and calcium hydroxide per 100 parts by weight of gypsum.

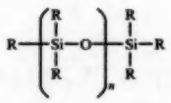
4,411,702

METHOD FOR SHEET FORMING A GYPSUM HARDENED BODY

Yoshio Makino; Yoshihiko Murata; Toshiaki Kakinuma, all of Saitama; Masaharu Yamaguchi, and Naoyuki Fujisawa, both of Chiba, all of Japan, assignors to Mitsubishi Mining & Cement Company Ltd.; Mitsubishi Cement Asbestos Company Ltd. and Toray Silicone Company Ltd., all of Tokyo, Japan

Continuation-in-part of Ser. No. 199,670, Oct. 22, 1980, abandoned. This application Mar. 12, 1982, Ser. No. 357,636
Claims priority, application Japan, Oct. 31, 1979, 54/141115
Int. Cl.³ C04B 11/14
U.S. Cl. 106—111 5 Claims

1. A method for sheet forming a gypsum hardened body from a mixed material composed of a main component consisting of gypsum dihydrate, slag and calcium hydroxide and additives in which said main components are added together and mixed with water to form a slurry, said slurry is molded into the form of a sheet and said sheet is hardened by curing, wherein the improvement comprises adding a part of said main component coated with hydrophobic diorganopolysiloxane fluid of the general formula



in which R represents a nonsubstituted monovalent hydrocarbon radical or a halogenated monovalent hydrocarbon radical and n represents a positive integral number to said mixed material.

4,411,703

COMPOSITION FOR APPLYING ANTIREFLECTIVE COATING ON SOLAR CELL

Daniel L. Whitehouse, Clarksburg, Md., assignor to Solarex Corporation, Rockville, Md.

Division of Ser. No. 227,929, Jan. 23, 1981, Pat. No. 4,328,260. This application Jan. 20, 1982, Ser. No. 341,128
Int. Cl.³ C08L 1/28; C07F 7/28; B05D 1/18
U.S. Cl. 106—189 5 Claims

1. A composition suitable for application onto the light impinging surface of a solar energy cell for forming an antireflective coating thereon, comprising:

(a) a thickening or suspension agent selected from the group consisting of methylcellulose and ethylcellulose;

(b) a liquid alcohol selected from the group consisting of aliphatic alcohols having at least six carbon atoms, terpenes and aromatic alcohols; and

(c) a metal alkoxide, said metal being selected from the group consisting of tantalum, titanium, niobium, yttrium, zirconium, tellurium and mixtures thereof.

4,411,704

PROCESS FOR IMPROVEMENT OF ADHESION BETWEEN MINERAL FILLERS AND THERMOPLASTIC POLYMERS

Andrzej Galeski; Ryszard Kalinski, and Marian Kryszewski, all of Lodz, Poland, assignors to Polska Akademia Nauk, Lodz, Poland

Continuation-in-part of Ser. No. 126,265, Mar. 3, 1980, abandoned. This application Oct. 16, 1981, Ser. No. 312,042
Int. Cl.³ C04B 31/40
U.S. Cl. 106—308 Q 2 Claims

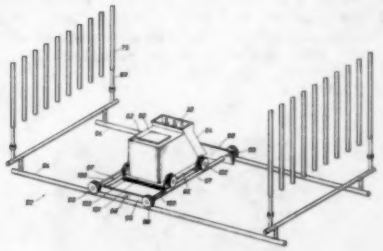
1. A process for improving adhesion between mineral fillers and thermoplastic polymers comprising coating the mineral filler with a thin layer of liquid ethylene oxide oligomer, wherein the mineral filler is a granular mineral filler selected from the group consisting of talc, silica, chalk, quartz, and kaolin, and the ethylene oxide oligomer has a molecular weight of 100–800.

4,411,705

FOR REMOVING PARTICLES FROM A TUBE BY MEANS OF A MISSILE

Othel D. Easley, Jr., Houston, and John T. Wooten, Crosby, both of Tex., assignors to Reactor Services International, Inc., Alvin, Tex.

Filed Nov. 4, 1981, Ser. No. 318,274
Int. Cl.³ B08B 9/02
U.S. Cl. 134—8 10 Claims



1. A method of removing bridged particles from a tube having a bottom entrance which comprises:

(a) positioning a missle firing means separate from and below the bottom entrance of a tube containing bridged particles so that a missile, when fired, will enter the bottom entrance of the tube and travel up the inside of the tube essentially parallel to the sides of the tube;

(b) activating the missile firing means so that it fires at least one missile into the bottom entrance of the tube with enough force to travel up the tube, strike and dislodge at least some of the particles, causing the dislodged particles to fall down the tube; and

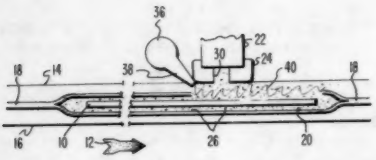
(c) repeating step b until the desired amount of the particles in the tube have fallen down and out of the bottom entrance of the tube.

4,411,706

METHOD AND APPARATUS FOR ELIMINATING DUST FROM INK JET PRINTERS

Harry L. Wallace, Livonia, and John D. Thomas, Plymouth, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jun. 25, 1981, Ser. No. 277,277
Int. Cl.³ B08B 5/00
U.S. Cl. 134—37 4 Claims



3. A method for preventing dust from accumulating on and around the jet head of an ink jet printer, where dust from a document processor is entrained in a first air-stream which carries the entrained air to the jet head, the method comprising:

generating a second air-stream;

controlling said second air-stream to cause the second air-stream to travel along a restricted path; and

directing said second air-stream into the path of said first air-stream to produce a turbulent condition tending to disrupt the path of said first air-stream and divert the dust entrained therein away from the ink jet head.

4,411,707

PROCESSES FOR MAKING CAN END STOCK FROM ROLL CAST ALUMINUM AND PRODUCT

Paul Brennecke, and Donald C. McAuliffe, both of Golden, Colo., assignors to Coors Container Company, Golden, Colo.

Filed Mar. 12, 1981, Ser. No. 243,033
Int. Cl.³ C22F 1/04
U.S. Cl. 148—2 23 Claims

1. A process for producing an aluminum alloy sheet stock comprising between about 0.4% to about 1% by weight of Manganese and containing an aluminum manganese dispersoid having a size and distribution to render the stock suitable for forming into can ends and can bodies comprising the steps of:

continuously chill roll casting aluminum alloy containing aluminum and manganese at a predetermined slab thickness;

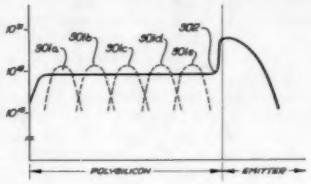
reducing the thickness of the slab by at least 60% to form an aluminum strip; and then annealing the strip at a temperature of about 825° to about 900° F.

4,411,708

METHOD OF MAKING PRECISION DOPED POLYSILICON VERTICAL BALLAST RESISTORS BY MULTIPLE IMPLANTATIONS

Lucien C. Winhan, Torrance, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Aug. 25, 1980, Ser. No. 180,914
Int. Cl.³ H01L 21/263, 21/26, 7/00
U.S. Cl. 148—1.5 11 Claims



1. A process for forming a vertical polysilicon resistor directly over and in electrical contact with a portion of the surface of a semiconductor device, comprising the steps of:

providing an electrically nonconductive mask to define the surface portion;

depositing a layer of polysilicon over the surface portion;

ion implanting into the polysilicon at plural discrete energy levels at least one conductivity affecting impurity;

annealing the semiconductor device to form a more uniform effective dopant concentration in the polysilicon in the range 10^{17} to 10^{19} atoms/cm^3; and

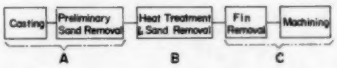
forming an electrical connection to the top of the polysilicon, thereby forming a resistor directly over and in electrical contact with the surface portion.

4,411,709

METHOD FOR MANUFACTURING ALUMINUM ALLOY CASTING

Teruo Nakanishi, Higashi, Japan, assignor to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Feb. 9, 1982, Ser. No. 347,269
Claims priority, application Japan, Feb. 21, 1981, 56-24792
Int. Cl.³ B22D 25/00
U.S. Cl. 148—3 7 Claims



1. A method for manufacturing a casting of aluminum alloy by the use of a mold having therein a destructible core made of sands and a resin binder, said casting having defined therein at least one cavity complemental in shape to the core, which method comprises the steps of:

pouring a molten aluminum alloy into the mold to form a casting therein;

removing the casting from the mold together with the core after it has been solidified;

destroying the core in the casting to such as to permit the removal of a portion of the sand used to form the core from the casting;

heating the casting to burn out and weaken the bonding capability of the resin component contained in the remaining sand located inside the casting so as to facilitate a complete removal of the sand therefrom, said casting being during the heating step, simultaneously subjected to a solid solution treatment and quenching treatment of the casting;

rapidly cooling the casting to quench it; and
drying said casting.

4,411,710

METHOD FOR MANUFACTURING A STRANDED CONDUCTOR CONSTITUTED OF INSULATED STRANDS

Masataka Mochizuki, Tokyo; Michio Takaoka, Chiba; Tsuneaki Moutai, Yachio; Shotaro Yoshida, and Kazuo Watanabe, both of Tokyo, all of Japan, assignors to The Fujikawa Cable Works, Limited, Tokyo, Japan

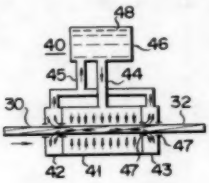
PCT No. PCT/JP81/00076, § 371 Date Nov. 23, 1981, § 102(e) Date Nov. 23, 1981, PCT Pub. No. WO81/02944, PCT Pub. Date Oct. 15, 1981

PCT Filed Apr. 2, 1981, Ser. No. 328,592

Claims priority, application Japan, Apr. 3, 1980, 55-43724; Apr. 3, 1980, 55-43725

Int. Cl.³ C23C *1/08*

U.S. Cl. 148—6.14 R **25 Claims**



1. A method of manufacturing a stranded conductor (30) comprised of a plurality of insulated strands, comprising:

passing an uninsulated stranded conductor (30) formed of a plurality of uninsulated strands in a stranded state through an oxidation treatment solution (48; 404) in an oxidation chamber (41), while keeping said stranded conductor immersed in said oxidation treatment solution as it passes therethrough; and

maintaining the pressure of said oxidation treatment solution (48; 404) at the outer portion of said stranded conductor greater than the pressure of said oxidation treatment solution (48; 404) at the inner portion of said stranded conductor (30) by a sufficient amount such that said oxidation treatment solution flows to the inner portions of said stranded conductor and flows through the interstices amoung each of the strands of said stranded conductor, thereby causing said oxidation treatment solution to discharge from said oxidation chamber by flowing through the interstices of the twisted strands of said stranded conductor into a discharge chamber adjacent said oxidation chamber.

4,411,711

PROCESS TO PRODUCE A REVERSIBLE TWO-WAY SHAPE MEMORY EFFECT IN A COMPONENT MADE FROM A MATERIAL SHOWING A ONE-WAY SHAPE MEMORY EFFECT

Joachim Albrecht, Mülligen; Thomas Duerig, Nussbaumen, and Günther Schroeder, Birmenstorf, all of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

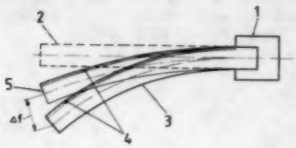
Filed Jul. 27, 1982, Ser. No. 402,273

Claims priority, application Switzerland, Feb. 5, 1982, 705/82

Int. Cl.³ C21D *8/00*

U.S. Cl. 148—11.5 A **5 Claims**

1. A process for inducing a reversible two-way shape memory effect in an already existing component made of a shape memory alloy exhibiting, under normal conditions, only a one-way effect comprising first solution treating said component in a temperature range of β-solid solution, subsequently water quenching and deforming inhomogeneously in such a way that a cross-section of said component is deformed to a sufficient degree to act as a counter-spring (due to the residual



stresses in the component) suppressing the one-way effect in the remainder of the cross-section (either undeformed or deformed to a lesser extent).

4,411,712

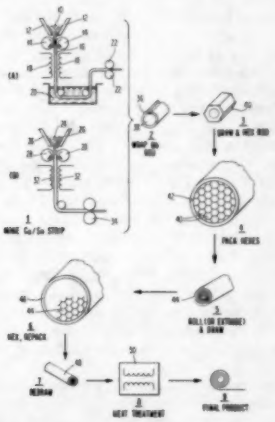
METHOD OF MANUFACTURE OF MULTIFILAMENTARY INTERMETALLIC SUPERCONDUCTORS

William G. Marancik, Basking Ridge, N.J., assignor to Airco, Inc., Montvale, N.J.

Continuation of Ser. No. 216,475, Dec. 15, 1980, abandoned. This application Sep. 29, 1982, Ser. No. 426,432

Int. Cl.³ H01L *39/24*

U.S. Cl. 148—11.5 Q **15 Claims**



1. A method for manufacturing a multifilamentary superconductor having the composition A_3B and the A-15 crystal structure, comprising the following steps:

encasing one or more rods or wires of the A material within a sheath of a material consisting essentially of a compacted composite of Cu and the B material said composite being formed by compaction of Cu powder into a porous matrix, sintering said porous matrix, and dipping said porous matrix into a bath of the B material, whereby said B material is infiltrated into the pores in said sintered porous Cu matrix;

working the sheathed rods to firmly consolidate said composite upon said rods;

packing a plurality of the worked sheathed rods together;

further working the assembled plurality of sheathed rods to a desired final shape and size; and

subjecting the worked assembly to a heat treatment for a time and at a temperature such that the compound A_3B is formed at the interfaces between the rods of the A material and the composite material.

4,411,713

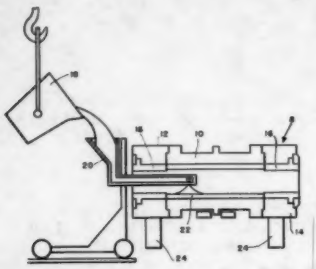
SHELL FOR A COMPOSITE ROLL

William H. Betts, Library, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 57,156, Jul. 12, 1979, abandoned. This application Jun. 25, 1982, Ser. No. 392,098

Int. Cl.³ B22D *13/00*

U.S. Cl. 148—35 **9 Claims**



1. An article of manufacture comprising a centrifugally cast shell of an iron base metal for a composite rolling mill roll, said shell in an as cast state having a desirable microstructure produced by heating a chill mold element employed to rapidly solidify the molten metal upon contact therewith to form said shell, said rapid solidification producing the formation of elongated crystals inwardly of the wall of the mold along the working surface of the roll which crystals are composed of primary carbides and an austenitic matrix, the temperature of said mold element being such that in cooling the molten metal from the liquidus temperature to the solidus temperature there remains substantially unchanged the effect of rapid cooling by said chill mold and said formation of elongated crystals formed in said solidification process which is the same general result as that obtained in a cast shell of the same metal produced in a generally identical non-heated mold, but which differs in that said temperature controls and decreases the cooling rate of the metal after said solidification has occurred for only a time period during a critical temperature range of approximately between 1600° and 2000° F. to cause complex carbide compounds to precipitate from the austenitic matrix before any substantial amount of pearlite can be formed, thereby to obtain said desirable microstructure which consists of a substantially martensitic matrix after cooling said article to room temperature.

4. In a method of casting an alloy metallic object such as the shell of a composite rolling mill roll, the steps comprising:

preparing a mold for reception of molten metal having an iron base with alloying elements that include carbon in the range of 2.5 to 3.5% and chromium in the range of 15 to 20% and which when in a non-equilibrium condition precipitate complex compounds,

said preparation including the employment of a chill mold element to form at least a part of the cast object and designed to rapidly solidify the metal on contact therewith during said solidification and to control at a given preheating temperature the cooling rate of the casting,

said rapid solidification producing the formation of elongated crystals inwardly of the wall of the mold along the working surface of the roll which crystals are composed of a primary carbide and austenitic matrix,

pouring said metal into said mold, and

prior to said pouring, heating said chill mold element to said preheating temperature such that in cooling the molten metal from the liquidus temperature to the solidus temperature there remains substantially unchanged the effect of rapid cooling by said chill mold and said formation of elongated crystals formed in said solidification process which is the same general result as that obtained in a cast shell of the same metal produced in a generally identical non-heated mold, but which differs in that said temperature controls and decreases the cooling rate of said metal after solidification has occurred for only a time period during a critical temperature range of approximately between 1600° and 2000° F. to cause complex carbide compounds to precipitate from the austenitic matrix before any substantial amount of pearlite can be formed, thereby to obtain a substantially martensitic matrix after cooling said casting to room temperature.

4,411,714

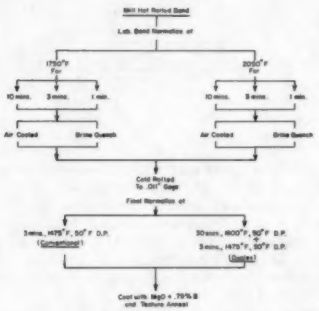
METHOD FOR IMPROVING THE MAGNETIC PROPERTIES OF GRAIN ORIENTED SILICON STEEL

Amitava Datta, Madison, N.J., and Carl P. Stroble, Natrona Heights, Pa., assignors to Allegheny Ludlum Steel Corporation, Pittsburgh, Pa.

Filed Aug. 24, 1981, Ser. No. 295,590

Int. Cl.³ H01F *1/04*

U.S. Cl. 148—111 **3 Claims**



1. In a method for producing grain oriented silicon steel including the steps of hot-rolling, at least one cold-rolling step with an annealing step prior to each cold-rolling, final normalizing, coating and final texture annealing, the improvement comprising during at least one said annealing step immediately prior to cold-rolling, heating said steel at a time and temperature at which transformation to austenite occurs, then quenching said steel prior to cold-rolling and immediately prior to final normalizing, heating said steel to a temperature above the austenite transformation temperature to provide a combination of good magnetic permeability and reduced core loss.

4,411,715

METHOD OF ENHANCING ROTOR BORE CYCLIC LIFE

Thomas A. Brisken, Cincinnati, and Alexander G. Maier, Forest Park, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

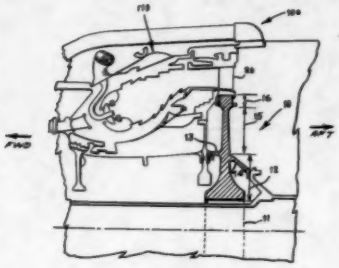
Filed Jun. 3, 1981, Ser. No. 270,051

Int. Cl.³ C21D *9/00*

U.S. Cl. 148—131 **9 Claims**

1. A method of enhancing the low cycle fatigue life of the bore area of a rotating disk wherein said disk also has a web/rim area with a rim area portion, comprising the step of prestressing said bore area by heating said web/rim area of said disk, while not heating said bore area of said disk, and while moderately overspeeding said disk, whereby a thermal gradi-

ent is applied to said disk rim area portion of said web/rim area, thereby adding a tensile stress in said bore area of said

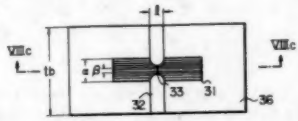


disk and subtracting stress in said rim area portion of said web/rim area of said disk.

4,411,716
AMORPHOUS ALLOYS FOR MAGNETIC HEAD CORE AND VIDEO MAGNETIC HEAD USING SAME

Kazuo Shiiki, Shiroyamamachi; Shigekazu Otomo, Hachioji; Mitsuhiro Kudo, Hamuramachi; Takeshi Kimura, Kokubunji; Noriyuki Kumasaka, Ome, and Hideo Fujiwara, Tachikawa, all of Japan, assignors to Hitachi, Ltd.; Hitachi Metals, Ltd. and Research Development Corporation of Japan, all of Tokyo, Japan

Filed Jul. 13, 1981, Ser. No. 282,805
Claims priority, application Japan, Jul. 11, 1980, 55/93987
Int. Cl.³ C22C *33/00*
U.S. Cl. 148—403 **15 Claims**



1. A magnetic head for video equipment comprising two members of magnetic material of high permeability juxtaposed against each other with a gap existing therebetween and having at least a portion in the vicinity of the gap of at least one of said members formed of an alloy in the form of at least one foil, said alloy foil being essentially amorphous, having a thickness of below 30 μm and having a composition expressed by a general formula $(Co_xFe_{1-x})_aCr_bSi_cB_{1-a-b-c}$ wherein the value of x is in the range between 0.925 and 0.97, the value of a is in the range between 0.74 and 0.76, the value of b is in the range between 0.005 and 0.03, and the value of c is in the range between 0.06 and 0.18, and wherein $a+b+c \leqq 0.94$.

4,411,717
SOLID ROCKET PROPELLANTS COMPRISING GUIGNET'S GREEN PIGMENT

William S. Anderson, Sunnyvale, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 2, 1983, Ser. No. 463,190
Int. Cl.³ C06B *45/06*
U.S. Cl. 149—18 **8 Claims**

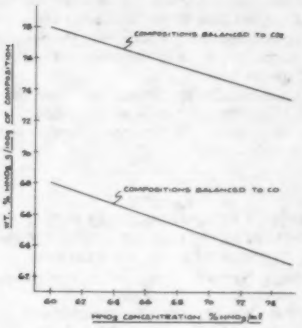
1. In a solid rocket propellant formulation comprising a major amount of ammonium perchlorate, a minor amount of aluminum powder, and a minor amount of a binder material, the improvement which comprises an effective burn rate improving amount of Guignet's green pigment.

5. In a solid rocket propellant formulation comprising a major amount of ammonium perchlorate, a minor amount of aluminum powder, and a minor amount of a binder material, the improvement which comprises an effective burn rate improving amount of oxidized Guignet's green pigment, prepared by heating Guignet's green pigment in the presence of oxygen at about 350° C. for about 10–60 minutes.

4,411,718
LIQUID EXPLOSIVE COMPOSITIONS FOR FIELD OPERATIONS

Joseph L. Trocino, 15233 Ventura Blvd., P-8, Sherman Oaks, Calif. 91403

Filed Oct. 26, 1981, Ser. No. 314,677
Int. Cl.³ C06B *47/04*
U.S. Cl. 149—74 **6 Claims**

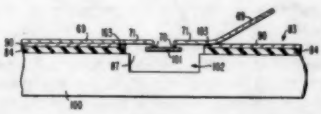


1. A completely liquid explosive composition consisting of 22.0 to 37.1% nitropropane blended with 62.9 to 78.0 nitric acid wherein said acid contains from 25.0 to 40.05% water and wherein said nitropropane is a mixture of 1-nitropropane and 2-nitropropane.

4,411,719
APPARATUS AND METHOD FOR TAPE BONDING AND TESTING OF INTEGRATED CIRCUIT CHIPS

Frank A. Lindberg, Catonsville, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 119,247, Feb. 7, 1980, Pat. No. 4,308,339. This application May 14, 1981, Ser. No. 263,962
Int. Cl.³ G01R *31/02, 31/22*
U.S. Cl. 156—64 **8 Claims**



6. A process for testing integrated circuit chips with at least a two-layer test tape having one layer constituting an insulative carrier strip with spaced sprocket openings along at least one side thereof and another layer constituting a series of leads overlying the insulative carrier along the length thereof, each frame constituting a plurality of said leads corresponding at least to the number of planar directions that the leads of an integrated circuit chip to be tested may extend, each of said patterns being a plurality of spaced parallel conductive lines corresponding to the maximum number of leads of a chip that extend in a respective one of the planar directions of a set, each of said leads being of a predetermined length and having an inner and an outer end, the outer end of each of said leads

terminating in a coplanar electrical contact pad, each of said frames having a polygonal central opening with a predetermined number of peripheral edges, said central opening having an area such that a selected portion of the lines of each set abut an opposing edge of the opening, said process comprising:

bonding a plurality of chips to be tested to a single layer metallic lead frame tape, said tape having spaced sprocket openings along at least one side thereof of predetermined spacing to register with the sprocket openings of the insulative layer of the test tape when superimposed thereon, said metallic tape having a plurality of lead frames spaced to register with at least a portion of the conductive lines of the test tape abutting the edge of the central opening when the sprocket hole of the metallic lead frame tape and the test tape are in registration,

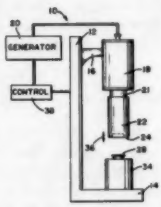
placing the sprocket holes of the metallic lead frame tape and the test tape in registration, bonding the conductive leads of the test tape to the registering leads of the lead frame a predetermined distance from the peripheral edge of the central opening and the outer end of the leads for each of the frames,

separating the metallic lead frame tape from the test tape while leaving the outer ends of the conductive leads in bonded relationship to the corresponding conductive strips of the test tape.

4,411,720
ULTRASONIC WELDING METHOD FOR SEALING A THERMOPLASTIC CAP TO THE NECK OF A THERMOPLASTIC CONTAINER

Thomas B. Sager, Newtown, Conn., assignor to Branson Ultrasonics Corporation, Newtown, Conn.

Filed Mar. 22, 1982, Ser. No. 360,485
Int. Cl.[3] B29C *27/08*; B65B *7/28*
U.S. Cl. 156—69 **2 Claims**



1. A method for ultrasonically welding the neck of a thermoplastic container to a thermoplastic cap, the latter having a flange superposed upon said neck and said flange having a lateral edge extending beyond the periphery of said neck, comprising the steps of:

providing an elongated ultrasonic resonator, dimensioned to be resonant as a half wavelength resonator when energized with ultrasonic energy of predetermined frequency at an input end and adapted to provide ultrasonic vibrations at an opposite output end, said resonator having a domical internal cavity with tapered wall extending from said output end of said resonator axially toward said input end, the maximum opening of said cavity being at least equal to the periphery of said neck;

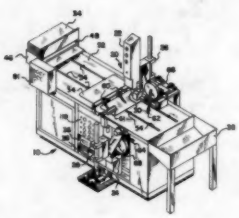
causing said output end of said resonator while rendered resonant to be in forced engagement with said cap and container for effecting, responsive to the vibrations and the engagement force exerted by said resonator, thermoplastic material from the edge of said flange to be softened and displaced from said flange and to be trapped as a peripheral bead along the wall of said cavity, and

ceasing ultrasonic vibrations when said trapped softened material is disposed as a peripheral bead around the interface between said flange and said neck of the container to permit said bead to solidify and to thereby form a seal between said cap and said neck.

4,411,721
APPARATUS AND METHOD FOR ATTACHING FASTENER TAPES

John G. Wishart, St. Joseph, Mo., assignor to The Mead Corporation, Dayton, Ohio

Filed Feb. 25, 1982, Ser. No. 352,285
Int. Cl.[3] B32B *31/04, 31/16*
U.S. Cl. 156—73.1 **15 Claims**



11. Apparatus for the application of patches of tape having a hook or loop fastener surface opposite a heat-activated adhesive surface to opposite sides of a notebook binder cover comprising:

a work station having at least two means for ultrasonically welding said patches of tape to said binder cover, at least one of said ultrasonic welding means being positioned above said binder cover for application of a patch to the top surface of said binder cover, and at least one of said ultrasonic welding means being positioned below said binder cover for application of a patch to the bottom surface of said binder, each of said ultrasonic welding means comprising a horn having a patch contacting surface substantially about the entire periphery thereof and a recessed central area in communication with a source of vacuum and means for vibrating said horn at a ultrasonic rate,

means for supplying said binder cover to said work station including a hopper having a pair of feed rollers which feed said binder covers sequentially onto a conveyor means for transporting said binder covers from said hopper to said work station, and

separate means for supplying said patches to each of said ultrasonic welding means at said work station, each supplying means comprising a transport arm, means for feeding a continuous strip of tape to said transport arm, and means for severing said strip of tape into patches of predetermined length, said transport arm being relatively moveable between a first position for receiving said patches and a second position for transferring said patches to respective ones of said horns.

4,411,722

METHOD FOR PRODUCING A NON-WOVEN FABRIC OF CROSS-LAMINATED WARP AND WEFT WEBS OF ELONGATED STOCKS

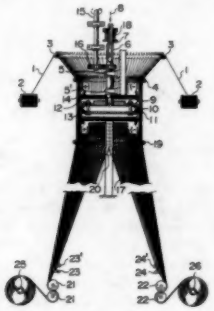
Masahide Yazawa, deceased, late of Tokyo, Japan; by Hiroshi Yazawa, executor, Kunitachishi; Kazuhiko Kurihara, Tokyo, Japan; Hiroshi Yazawa, Kunitachishi, Japan; Yuki Kuroiwa, Tokyo, Japan, and Shuichi Murakami, Itabashi, Japan, assignors to Polymer Processing Research Institute Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 134,507, Mar. 27, 1980, abandoned, which is a continuation of Ser. No. 767,198, Feb. 9, 1977, abandoned, which is a continuation of Ser. No. 527,920, Nov., 1974, abandoned. This application Jul. 2, 1981, Ser. No. 279,839

Claims priority, application Japan, Nov. 29, 1973, 48-134525

Int. Cl.³ B32B *31/00*

U.S. Cl. 156—167 8 Claims



1. In the method for producing a non-woven fabric of cross-laminated warp web as a web in the machine direction and weft webs as webs in the lateral direction thereto,

said warp web and said weft webs both comprising parallel elongated stocks and being bonded only at the crossing points of said parallel elongated stocks of said warp web and said weft webs, and

said weft webs being produced by applying laterally to cylindrically arranged and longitudinally running, preformed, elongated stocks, a number of filaments ejected radially through the orifices furnished on the outer periphery of a rotating vessel wherein a raw material to form said filaments is contained in molten state, provided at the central part of said running stocks,

and cutting open the resulting tubular material,

the improvement which comprises:

(a) employing as said material to form said ejected filaments, an adhesive polymer having both a good affinity for said running stocks and a lower melting point than that of said running stocks;

(b) applying said ejected filaments onto said running stocks in a state where the filaments still have adhesiveness for said running stocks, such application of the ejected filaments being in parallel arrangement and in multiple stages, to thereby fix the arrangement of said running stocks in the lateral direction thereof by means of said filaments themselves;

(c) cutting the resulting weft web into a series of lengths, each length corresponding to the width of the cross-laminated product to be produced;

(d) successively placing said cut weft webs onto said warp web without any gaps therebetween in such a manner that the parallel elongated stocks of said warp web and the parallel elongated stocks of said weft webs cross each other in an overlying relationship, and

(e) applying heat to said overlying warp and weft webs while guiding the overlay onto a heated drum to thereby pass over the drum, melt said adhesive filaments, and permit the melted adhesive to redistribute on said warp and weft webs at their crossing points, thus obtaining a cross-laminated product having a precise lattice arrangement.

4,411,723

GLASS FIBER-REINFORCED CEMENT PLATES

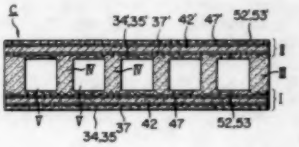
Shigeru Takeuchi, Osaka, Japan, assignor to Kurimoto Iron Works, Ltd., Osaka, Japan

Division of Ser. No. 191,801, Sep. 29, 1980, Pat. No. 4,335,177. This application Dec. 10, 1981, Ser. No. 329,456

Claims priority, application Japan, Oct. 3, 1979, 54-129019; Jul. 18, 1980, 55-99041; Jul. 21, 1980, 55-99647

Int. Cl.³ B29B *31/00*

U.S. Cl. 156—242 12 Claims



7. A process for the manufacture of a laminated, glass fiber-reinforced, hydraulic cement plate comprising:

forming on an elongated, substantially horizontal conveyor, which is moving substantially horizontally in the lengthwise direction thereof, a laminated bottom layer structure comprising, in successively formed layers, a first layer adjacent to said conveyor and comprising hydraulic cement mortar and chopped glass-fiber strands, a second layer formed on said first layer and comprising continuous glass fibers, a third layer formed on said second layer and comprising regulated set hydraulic cement mortar, a fourth layer formed on said third layer and comprising continuous glass fibers, and a fifth layer formed on said fourth layer and comprising hydraulic cement mortar and chopped glass-fiber strands;

moving said conveyor having said bottom layer structure thereon in a substantially horizontal direction beneath a mold disposed above said bottom layer structure, said mold having a plurality of separate, parallel, elongated bars which are substantially parallel with and flush with the upper surface of said bottom layer structure on said conveyor and extending lengthwise in the direction of travel of said conveyor, said bars being spaced-apart from each other across the width of said conveyor;

in said mold, pouring regulated set hydraulic cement mortar between said bars as said bottom layer structure travels with said conveyor so that the spaces between said bars become filled with regulated set hydraulic cement mortar, whereby an intermediate layer of said regulated set, hydraulic cement mortar is formed on top of said bottom layer structure, said intermediate layer containing said bars;

forming on top of said intermediate layer a laminated top layer structure comprising, in successively formed layers, a sixth layer adjacent to said intermediate layer and comprising hydraulic cement mortar and chopped glass-fiber strands, a seventh layer formed on said sixth layer and comprising continuous glass fibers, an eighth layer formed on said seventh layer and comprising regulated set hydraulic cement mortar, a ninth layer formed on said eighth layer and comprising continuous glass fibers, and a tenth layer formed on said ninth layer and comprising hydraulic cement mortar and chopped glass-fiber strands;

moving said conveyor having the assembly of said bottom layer structure, intermediate layer and top layer structure horizontally through a curing zone while said bars remain

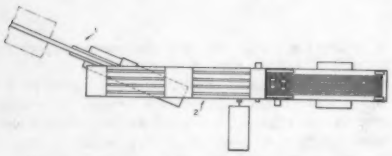
within said intermediate layer and thereby curing said assembly; and

then moving said conveyor having the assembly of said bottom layer structure, intermediate layer and top layer structure thereon horizontally beyond the ends of said bars, so that said bars are no longer within said intermediate layer, thereby forming a laminated, fiber-reinforced, hydraulic cement plate having internal spaces formed by said bars, which spaces extend lengthwise of said plate and parallel with the direction of travel of the upper surface of said conveyor belt.

4,411,724
PROCESS OF AND APPARATUS FOR SPLICING CORD PLY SEGMENTS AT THEIR END FACES

Taizo Ito, Higashimurayama, and Yusuke Araki, Tachikawa, both of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Sep. 22, 1982, Ser. No. 421,318
Claims priority, application Japan, Sep. 29, 1981, 56-154204
Int. Cl.³ B32B *25/10*
U.S. Cl. 156—304.1 **3 Claims**



1. A splicing process of splicing together the leading end face of one of cord ply segments and the trailing end face of another cord ply segment positioned in front of one of the cord ply segments, comprising the steps of:

preparing a first conveyor having a first surface on which each of the cord ply segments are conveyed by the first conveyor in a first conveyance direction at a first conveyance speed, a second conveyor fixed with respect to said first conveyor and having a second surface spaced apart from and in face-to-face relationship to the first surface of said first conveyor and for conveying the cord ply segments on the second surface thereof in a second conveyance direction substantially in parallel with the first conveyance direction of said first conveyor, magnetic retaining means for retaining the cord ply segments on the first and second surfaces of the first and second conveyors, respectively and transfer means for transferring each of the cord ply segments on the first surface of said first conveyor to the second surface of said second conveyor,

placing a plurality of cord ply segments, severed to have a predetermined length, on a first conveyor at a predetermined interval and at a predetermined angle with respect to the first conveyance direction of the first conveyor,

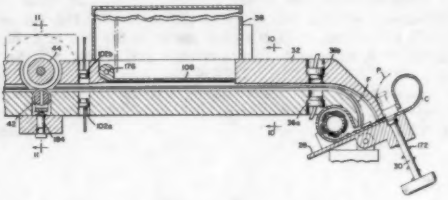
conveying the cord ply segments on the first conveyor at a predetermined speed, and

transferring the cord ply segments from the first conveyor to the second conveyor to splice together the leading end face of one of cord ply segments and the trailing end face of another cord ply segment positioned in front of one of the cord ply segments already transferred on said second conveyor in such a manner that the leading end face of one of cord ply segments is brought into contact with the second surface of the second conveyor with the leading end portion of one of the cord ply segments sliding with respect to the second surface of said second conveyor while said second conveyor is operated to move at a speed slower than that of the first conveyor.

4,411,725
DAYLIGHT FILM SPLICER

John H. Siegel, Bellevue, and Gerald L. Edwards, Seattle, both of Wash., assignors to CX Corporation, Seattle, Wash.

Filed Oct. 5, 1977, Ser. No. 839,603
The portion of the term of this patent subsequent to May 25, 1999, has been disclaimed.
Int. Cl.³ G03D *15/04*
U.S. Cl. 156—353 **17 Claims**



1. A film strip splicing machine comprising,

guide means for guiding a film strip along a predetermined travel path from a film entry to a spliced film storage container,

reciprocating film cutting means at a cutting station along the travel path for cutting off a lead end portion of the film strip in a first cutting direction and for cutting off a trailing end portion of the film strip in a reverse cutting dirction,

film splicing means at a splicing station further along the travel path than the cutting station for splicing the cut lead end of one film strip to the cut trailing end of another,

first drive means between the entry and the cutting station for advancing each film strip through the cutting station to the splicing station,

second drive means between the splicing station and the storage container for advancing spliced film strips to said container,

control means operatively associated with the cutting means, splicing means, and first and second drive means for automatically activating and deactivating them in a predetermined sequence whereby each film strip has its lead end cut off at the cutting station and the fresh-cut lead end thereof advanced to the splicing station and spliced to the trailing end of a film strip in front thereof, and whereby the two spliced films are then advanced together until the trailing film strip has had a trailing end portion cut off at the cutting station and the fresh-cut trailing end thereof advanced to the splicing station, and

housing means for making said travel path, two drive means, and two stations free of light.

4,411,726
APPARATUS FOR SPIN BONDING ENDS FOR COMPOSITE CONTAINERS

Stephen E. Woerz, Florissant, and Travis K. Canup, Ferguson, both of Mo., assignors to Boise Cascade Corporation, Boise, Id.

Division of Ser. No. 228,344, Jul. 30, 1981, Pat. No. 4,353,761. This application May 6, 1982, Ser. No. 375,706
Int. Cl.³ B29C *27/08*; B65B *7/28*
U.S. Cl. 156—423 **5 Claims**

1. Apparatus for spin bonding to an outwardly flared end of a vertically arranged tubular composite container body member an end closure member formed of thermoplastic synthetic plastic material, said body member including a fibrous body wall layer, an inner liner layer formed of a thermoplastic synthetic plastic material, and an outer label layer, said end closure member including, opposite said body member, annular inner fin and outer chime portions that are concentrically spaced to define an annular groove arranged to receive the adjacent extremity of said body member, said groove having side walls that converge in the direction of the bottom of the groove, the

inner and outer surfaces of said fin portion being vertical and tapered inwardly respectively, said apparatus comprising

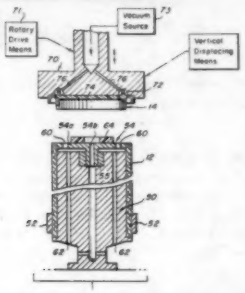
(a) vertically arranged stationary central mandrel means adapted for insertion within the container body member;

(b) means for releasably connecting the container body member with said central mandrel means;

(c) rotary chuck means in vertical alignment with, and axially displaceable relative to, said central mandrel means, said rotary chuck means being rotatably driven at a rotational velocity sufficient to effect friction weld bonding;

(d) means for releasably mounting an end closure member on said rotary chuck means; and

(e) means for rotatably supporting the inner surface of said



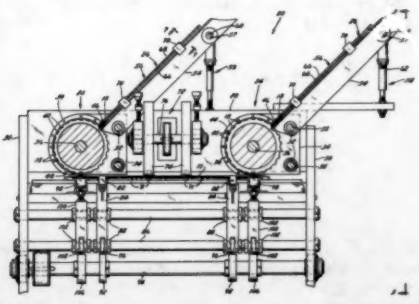
fin portion against radial inward displacement when said rotary chuck means is axially displaced relative to said central mandrel means, said fin support means comprising rotary mandrel means rotatably connected with one end of said central mandrel means, said rotary mandrel means including a vertically arranged substantially cylindrical disk portion having a diameter generally equal to the inner diameter of said fin portion, whereby when the extremity of said body member is wedged within said groove, the tapered fin portion is wedged between the disk portion of said fin support means and the inner surface of the body member to effect frictional engagement between said fin portion and said inner liner layer, thereby to spin bond the contiguous thermoplastic materials.

4,411,727

HANGER ROD TRANSFER ASSEMBLY FOR HANGING-TYPEFILE FOLDERS

Robert Seiy, Milwaukee, Wis., assignor to The Kempsmith Machine Company, Milwaukee, Wis.

Filed Jun. 22, 1981, Ser. No. 275,840
Int. Cl.³ B32B *31/12*; B23Q *7/02*
U.S. Cl. 156—562 **12 Claims**



1. A machine for automatically applying hanger rods to the opposite edges of a file folder blank, said machine including

a conveyor for carrying file folder blanks in succession along a longitudinal path,

a glue applicator for applying strips of glue at a spaced distance from and parallel to the edges of each blank,

the improvement comprising means for depositing hanger rods on the glue strip on each edge of the blank,

said means including a hanger rod magazine and

a hanger rod transfer assembly for transferring hanger rods from the magazine to a position immediately above the glue strip on the blank,

said hanger rod transfer assembly includes two pair of transfer wheels,

one pair of transfer wheels being mounted for rotary motion on each edge of the blank in a direction transverse to the direction of travel of the blanks and having a plurality of grooves for carrying the hanger rods from the magazine to a release point above the blank,

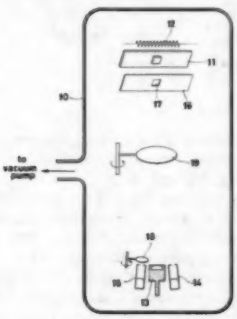
said hanger rod being released from said grooves as the groove is moved to a position above the glue strip.

4,411,728

METHOD FOR MANUFACTURE OF INTERDIGITAL PERIODIC STRUCTURE DEVICE

Tsunenori Sakamoto, Ibaragi, Japan, assignor to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Mar. 30, 1981, Ser. No. 248,961
Int. Cl.³ C30B *25/04*
U.S. Cl. 156—606 **4 Claims**



1. In a method for manufacturing an interdigital periodic structure device, comprising the steps of:

(a) disposing a growth substrate and a heater arranged to apply heat to said substrate in an ultra-high vacuum chamber;

(b) disposing a main evaporation source substantially opposite said substrate for evaporating a main semiconductor material so as to form thin semiconductor films on said substrate;

(c) interposing a mask defining a hole between said substrate and said main evaporation source in the vicinity of said substrate;

(d) disposing a p-type impurity evaporation source near one side of, and adjacent said main evaporation source so as to dope said semiconductor films except one side part thereof with said p-type impurity through said hole defined in said mask;

(e) disposing an n-type impurity evaporation source adjacent said main evaporation source and placed substantially symmetrically thereabout with respect to said p-type impurity evaporation source so as to dope the semiconductor films except the other side part thereof with an n-type impurity through said hole defined in said mask;

(f) interposing a main shutter having open and closed states

between said substrate and said main- and said impurity-evaporation sources;

(g) disposing another shutter between at least one of said impurity evaporation sources and said substrate so as to control doping of said semiconductor films from said one of said impurity evaporation sources;

(h) allowing molecular beams of at least one element from said main- and from said impurity-evaporation sources to be evaporated and projected through said hole defined in said mask onto said substrate, while heating said substrate; and

(i) alterately opening and closing said other shutter at time intervals when said main shutter is in said open state.

4,411,729
METHOD FOR A VAPOR PHASE GROWTH OF A COMPOUND SEMICONDUCTOR

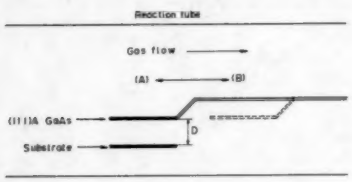
Junji Komeno, Fujisawa, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 26, 1980, Ser. No. 191,296

Claims priority, application Japan, Sep. 29, 1979, 54-124719; Sep. 29, 1979, 54-124720

Int. Cl.³ C30B *25/18*

U.S. Cl. 156—612 **20 Claims**



1. A vapor phase method of growing a compound semiconductor on a semiconductor crystalline substrate having a major surface comprising the steps of:

placing in a reaction chamber said semiconductor crystalline substrate and a dummy crystalline substrate having a crystallographic orientation different from that of said semiconductor crystalline substrate; and

establishing a reaction gas flow in said reaction chamber along the major surface of said semiconductor crystalline substrate to conduct said vapor phase growth, said dummy substrate being placed in a predetermined position opposite to and close to said semiconductor crystalline substrate during at at least a part of the period of said vapor phase growth for affecting in a predetermined manner the impurity concentration of the compound semiconductor grown on said semiconductor crystalline substrate.

4,411,730
SELECTIVE CHEMICAL MILLING OF RECAST SURFACES

Robert E. Fishter, Boca Raton, and Henry Lada, Lake Park, both of Fla., assignors to United Technologies Corporation, Hartford, Conn.

Continuation-in-part of Ser. No. 192,668, Oct. 1, 1980, abandoned. This application Jan. 11, 1982, Ser. No. 338,739

Int. Cl.³ C23F *1/00*; B23K *9/00*; C09K *13/04*

U.S. Cl. 156—626 **8 Claims**

1. Machining the surface of a nickel-base superalloy workpiece by the process which comprises:

removing workpiece material using a thermal-effect process which causes melting and vaporization of metal, thereby leaving on the workpiece surface a recast layer; and

contacting the surface from which material is removed with an etchant comprised by volume percent of 40–60 HNO_3, 5–20 HCl, balance H_2O, at least 0.016 moles/liter $CuSO_4$ and 0.008–0.025 moles/liter $FeCl_3$, thereby chemically dissolving the recast layer without substantially removing other workpiece surface material.

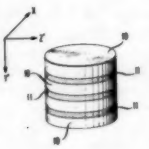
4,411,731
METHOD OF CONTOURING CRYSTAL PLATES

Anton J. Miller, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 27, 1982, Ser. No. 453,348

Int. Cl.³ B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—630 **10 Claims**



1. A method of fabricating piezoelectric devices which include crystal plates comprising the steps of providing a stack of such plates separated by a bonding material, and contouring such plates by immersing the stack in an etchant which dissolves the bonding material and etches the exposed portions of the plates.

4,411,732
METHOD OF MANUFACTURING A DETECTOR DEVICE

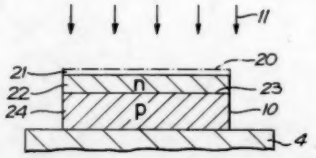
John T. M. Wotherspoon, Southampton, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 3, 1982, Ser. No. 355,440

Claims priority, application United Kingdom, Mar. 27, 1981, 8109774

Int. Cl.³ H01L *21/306*; B44C *1/22*; C03C *15/00, 25/06*

U.S. Cl. 156—643 **8 Claims**



1. A method of manufacturing an infrared radiation detector device of cadmium mercury telluride, comprising the steps of (a) providing a body of cadmium mercury telluride at least a portion of which has conductivity characteristics of p-type material at the operating temperature of the device, and (b) bombarding with ions at least a part of a surface of the body to convert at least a part of said body portion into material having

conductivity characteristics of n-type material at the operating temperature of the device, characterized in that the ion bombardment is effected using ion etching to etch away a part of the body at the bombarded surface, and in that the dose, energy and mass of the bombarding ions are such that adjacent the bombarded surface a sufficient excess concentration of mercury is produced from the etched-away part of the body as to act as a dopant source for converting an adjacent part of said body into material having the n-type conductivity characteristics, said ion dose being sufficiently large to convert said adjacent part of the body over a depth greater than twice the penetration depth of said ions in said body, and the energy of the bombarding ions being less than 30 keV.

4,411,733

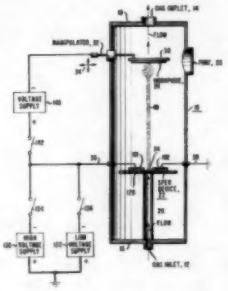
SPER DEVICE FOR MATERIAL WORKING

John J. Macklin, Highlands; William T. Silfvast, Holmdel, both of N.J., and Obert R. Wood, II, New York, N.Y., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jun. 18, 1982, Ser. No. 389,780

Int. Cl.³ H01L *21/306;* **C23F** *1/00;* **B05D** *3/06;* **B05B** *5/02*

U.S. Cl. 156—643 **12 Claims**



9. A method of etching a layer from a workpiece comprising the steps of:

generating an ion vapor plasma in the gap of a SPER device,

flowing gas through said gap so as to cause said plasma to take the shape of a beam which strikes said workpiece, and

accelerating the ions in said beam so that they strike said workpiece with sufficient energy to etch away said layer.

4,411,734

ETCHING OF TANTALUM SILICIDE/DOPED POLYSILICON STRUCTURES

Jer-shen Maa, Manville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 9, 1982, Ser. No. 448,279

Int. Cl.³ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00;* **C23F** *1/02*

U.S. Cl. 156—643 **19 Claims**

1. A method of forming a patterned structure on a substrate comprised of a layer of doped polycrystalline silicon having thereover a layer of tantalum silicide, said method comprising:

(a) providing a layer of polycrystalline silicon on the substrate;

(b) doping the silicon layer to render it conductive;

(c) plasma treating the surface of the silicon layer with a mixture of carbon tetrafluoride and oxygen to prepare the surface for deposition of tantalum silicide;

(d) depositing a layer of tantalum silicide onto the silicon layer;

(e) anisotropically plasma etching the tantalum silicide layer and the silicon layer with an etchant mixture of carbon tetrachloride, oxygen and nitrogen; and

(f) heating the resulting structure to a temperature sufficient to anneal the tantalum silicide layer.

4,411,735

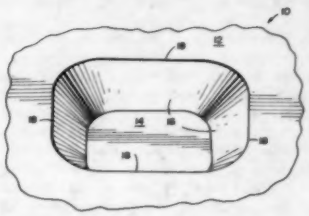
POLYMERIC INSULATION LAYER ETCHING PROCESS AND COMPOSITION

Jagdish G. Belani, Cupertino, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 6, 1982, Ser. No. 375,575

Int. Cl.³ B44C *1/72;* **C03C** *15/00, 25/06*

U.S. Cl. 156—659.1 **17 Claims**



1. A process for fabricating a semiconductor device having a patterned polyimide or polyimide-iso-indroquinazolinedione insulating layer on said device, comprising applying a layer of uncured polyimide or polyimide-iso-indroquinazolinedione resin on a surface of said device, heating said resin layer to produce a first level of partial curing in said resin layer, applying a photoresist layer to said partially cured resin layer, developing said photoresist layer to uncover said partially cured resin layer where it is to be removed, etching said partially cured resin layer to produce said patterned layer, heating said patterned layer to produce a second level of partial curing which is sufficient to prevent organic photoresist strippers from attacking the patterned layer, stripping the developed photoresist with an organic photoresist stripper, and heating said patterned layer a sufficient extent to complete the curing of said polyimide or polyimide-iso-indroquinazolinedione resin.

4,411,736

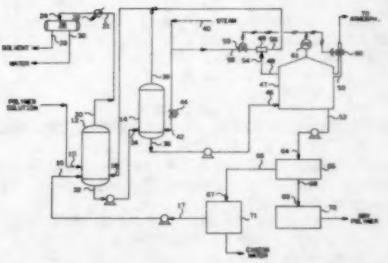
METHOD FOR VAPOR RECOVERY FROM A POLYMER SLURRY

John S. Hubby, Cronulla, Australia, assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 177,956, Aug. 14, 1980, Pat. No. 4,347,098. This application Jan. 13, 1982, Ser. No. 339,229

Int. Cl.³ B01D *1/14, 3/00;* **C08F** *6/10*

U.S. Cl. 159—47.1 **11 Claims**



1. A method comprising:

passing a first polymer slurry comprising water, polymer and liquid solvent to a first polymer recovery zone;

vaporizing at least a portion of the liquid solvent in the first polymer slurry with steam in the first polymer recovery zone to produce water vapor, solvent vapor and a second

polymer slurry comprising water, polymer and liquid solvent;

passing the second polymer slurry from the first polymer recovery zone at a first pressure to a second polymer recovery zone at a second pressure, said second pressure being a lower pressure than said first pressure;

vaporizing at least a portion of the water and liquid solvent in the second polymer slurry in the second polymer recovery zone to produce water vapor, solvent vapor and a third polymer slurry comprising polymer crumb and water;

passing the water vapor and the solvent vapor from the second polymer recovery zone to a vapor recovery zone;

recovering the water vapor and the solvent vapor from the second polymer recovery zone;

combining the water vapor and the solvent vapor from the second polymer recovery zone with water vapor and solvent vapor from the first polymer recovery zone; and

introducing the combined vapors as a stripping vapor in a third polymer recovery zone at a third pressure to produce the first polymer slurry as well as water vapor and solvent vapor.

4,411,737

PULP TREATING PROCESS

Sergio F. Galeano, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 103,141, Dec. 13, 1979, abandoned. This application Aug. 4, 1981, Ser. No. 289,944

Int. Cl.³ D21C 5/02, 9/00

U.S. Cl. 162—7 **7 Claims**

1. In a method for producing paper which includes the steps of preparing a slurry of fibers of high lignin content pulp having a predetermined freeness and containing from 1 to 20 percent by weight of fibers at least 50 percent of which are softwood fibers, and not more than 3.0 percent of residual cooking chemicals, refining the slurry to enable the production therefrom of paper having predetermined properties, forming a web from the slurry and drying the web, the improvement of treating the high lignin content pulp slurry, prior to the refining step, with about 15 to 25 percent by weight based on the oven dried weight of the fibers in the slurry of a sodium sulfite, sodium sulfide and sodium carbonate solution at atmospheric pressure at a temperature of at least 60° C. at a pH of at least 10 for from 10 to 60 minutes, the amount of the sulfite-sulfide-carbonate solution being sufficient that the treatment increases the strength of paper made at the same degree of freeness and without substantial loss in yield, the mole ratio of sodium sulfite to sodium sulfide being about 0.1:1 to 2.0:1.

7. A method as defined in claim 1 for producing paperboard from corrugating board comprising the steps of loosening the fibers from the corrugated board in water with the help of mechanical action to form said slurry having a consistency of about 5 to 10 percent, said refining being to a Canadian Standard Freeness between about 280 to 700.

4,411,738

PRESS CYCLE REDUCTION FOR WET PRESSED HARDBOARD

Bruce A. Wittrup, Hoffman Estates, and Kendall D. White, Jr., Palatine, both of Ill., assignors to United States Gypsum Company, Chicago, Ill.

Filed Apr. 30, 1982, Ser. No. 373,383

Int. Cl.³ D21H 5/14

U.S. Cl. 162—142 **13 Claims**

1. A method for the manufacture of hardboard which comprises forming an aqueous slurry of a defiberized wood having a TAPPI SFMC freeness of about 10 seconds or less, a thermosetting binder, and from about 2% to about 15%, based on the total fiber weight, of finely divided fibers having a Canadian standard freeness of about 450 mls. or slower; forming a mat by depositing said slurry on a screen and allowing a portion of the slurry water to drain through the screen; placing the wet mat in a hardboard press having one imperforate platen and a screen on the other platen; consolidating the wet mat in the press under a pressure of from about 400 to about 3000 pounds per square inch to the desired thickness and forming a barrier of finely divided fibers in the mat, wherein the press residence time is from about 5 to about 20 minutes for a 7/16" board and is proportionately shorter or longer for a thinner board and a thicker board, respectively; whereby steam pressure is built up in the mat and the setting of the binder is accelerated by heating the wet mat in the press to a core temperature of from about 300° F. to about 350° F.

4,411,739

PROCESS FOR THE RECTIFICATION OF BINARY LIQUID MIXTURES

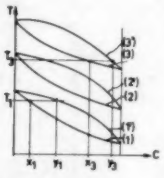
Jacques Sterlini, Paris, France, assignor to Cie Electro Mecanique, France

Filed Aug. 5, 1981, Ser. No. 290,224

Claims priority, application France, Aug. 5, 1980, 80 17313

Int. Cl.³ B01D 3/14

U.S. Cl. 203—24 **5 Claims**



1. In a process for the rectification of a liquid mixture comprised of components A and B which are liquid at ambient conditions, component A being more volatile than component B, wherein said mixture is fed to the intermediate stage of a rectification column comprising in sequence a depletion stage, an intermediate stage, and a rectification stage, a vapor stream and a liquid stream passing between said stages in a countercurrent manner with said vapor steam moving in a direction from said depletion stage toward said rectification stage and said liquid stream moving in a direction from said rectification stage toward said depletion stage, said vapor and liquid being in equilibrium in each stage, component A being recovered as a vapor from said rectification stage and component B being recovered as a liquid from said depletion stage, the temperature-pressure relationship in the column being such that substantially pure component A vapor is present in the rectification stage and substantially pure component B liquid is present in the depletion stage, the improvement whereby the thermodynamic efficiency of the rectification process is increased comprising:

(a) compressing said recovered component A vapor stream to provide a first compressed component A vapor stream;

(b) passing said first compressed component A vapor stream together with a second compressed component A vapor stream from step (g) in an indirect heat exchange relationship with said depletion stage to partially condense said component A vapor stream and supply heat to said depletion stage;

(c) recovering a portion of said condensed component A as product;

(d) recovering a portion of said component B liquid stream as product;

(e) passing the non-condensed portion of said component A vapor stream in indirect heat exchange relationship with the remainder of said component B liquid stream not recovered as product in step (d) to vaporize said component B liquid stream and recycling said vaporized component B stream to said depletion stage;

(f) passing at least a portion of said condensed portion of component A to said rectification stage as a reflux stream;
(g) cooling at least another portion of said condensed portion of component A by passing the same through expansion means and passing it in indirect heat exchange relationship with said rectification stage to vaporize said condensed portion of component A; and
(h) compressing said vaporized portion of component A from step (g) and combining it with said compressed portion of component A from step (a).

4,411,740

SEPARATION OF CHLOROSILANES BY EXTRACTIVE DISTILLATION

Ora L. Flaningam, Midland, Mich., and Roland L. Halm, Madison, Ind., assignors to Dow Corning Corporation, Midland, Mich.

Filed Sep. 20, 1982, Ser. No. 419,854
Int. Cl.³ B01D 3/40; C07F 7/20
U.S. Cl. 203—58 **6 Claims**

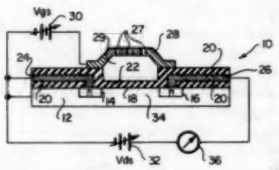
1. A method of separating close-boiling chlorosilanes which comprises removal, by extractive distillation, of the lower-boiling chlorosilane from the close-boiling chlorosilanes by heating a mixture of the close-boiling chlorosilanes with sulfolane to extractively distill the lower-boiling chlorosilane from the mixture and thereafter separating the sulfolane and the higher-boiling chlorosilane.

4,411,741

APPARATUS AND METHOD FOR MEASURING THE CONCENTRATION OF COMPONENTS IN FLUIDS

Jiri Janata, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Filed Jan. 12, 1982, Ser. No. 338,943
Int. Cl.³ G01N 27/46
U.S. Cl. 204—1 T **22 Claims**



1. An apparatus for detecting a concentration of components in a fluid, comprising:
a semiconductor substrate having a doping polarity;
at least two diffusion regions located at a surface of said substrate;
an electrically insulating layer overlying the surface of said substrate between said diffusion regions;
a bridge member mounted to said insulating layer so as to form a gap therebetween, said bridge member allowing for passage of fluid into said gap and said bridge member being capable of having an electrical charge imposed upon it;
means for imposing an electrical charge on said bridge member; and
means for imposing an electrical potential between said diffusion regions.

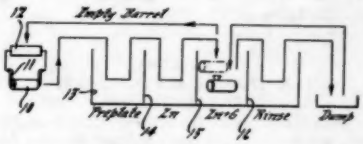
20. A method for detecting a concentration of components in a fluid, comprising the steps of:
doping a semiconductor substrate so as to impart a doping polarity to the substrate;
forming at least two diffusion regions at the surface of the substrate;
insulating the surface of the substrate between the diffusion regions by placing an electrical insulating layer adjacent the substrate;
mounting a bridge member to the insulating layer so as to form a gap between the bridge member and the insulating layer;
imposing an electrical charge on the bridge member;
imposing an electrical potential between the diffusion regions;
introducing a fluid through the bridge member and into the gap between the bridge member and the insulating layer; and
detecting current flow between the diffusion regions.

4,411,742

ELECTROLYTIC CODEPOSITION OF ZINC AND GRAPHITE AND RESULTING PRODUCT

William A. Donakowski, Dearborn Heights, and John R. Morgan, Southfield, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/01689, § 371 Date Dec. 1, 1982, § 102(e) Date Dec. 1, 1982
PCT Filed Dec. 1, 1982, Ser. No. 463,454
Int. Cl.³ C25D 5/48, 7/00, 15/00
U.S. Cl. 204—16 **20 Claims**



1. An electrolytic codeposit of zinc and graphite useful as a composite coating on parts subject to sliding friction, said codeposit containing uniformly distributed graphite in an amount of 30–48% by weight of the codeposit, a coefficient of friction equal to or less than 0.130, at a plated thickness of about 0.0005", showing (a) no red rust in a salt spray environment for at least 72 hours, and (b) no destruction due to corrosion in an industrial environment containing sulphur dioxide after four months.

4,411,743

ELECTROLYTIC PALLADIUM BATH AND PROCESS

Erika Kreuter, Rodenbach, and Wolfgang Zilske, Hanau, both of Fed. Rep. of Germany, assignors to Degussa, Frankfurt, Fed. Rep. of Germany

Filed Apr. 22, 1982, Ser. No. 370,817
Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118908
Int. Cl.³ C25D 3/50
U.S. Cl. 204—47 **25 Claims**

1. An electrolytic aqueous palladium nitrate-free bath containing palladium sulfite and an acid wherein the bath contains 80–95% of the palladium as palladium sulfate and the balance as palladium sulfite.

4,411,744
BATH AND PROCESS FOR HIGH SPEED NICKEL ELECTROPLATING

Donald R. Rosegren, Cresskill, and Linda J. Mayer, Denville, both of N.J., assignors to Occidental Chemical Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 199,894, Oct. 23, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 407,662

Int. Cl.³ C25D *3/12*

U.S. Cl. 204—49 **5 Claims**

1. An electroplating bath suitable for use with insoluble anodes in the electrodeposition of semi-bright, ductile and stress-free nickel deposits, said bath comprising a nickel salt; an electrolyte selected from the group consisting of boric acid and citric acid; ortho-formyl benzene sulfonic acid as a brightener; and a wetting agent comprising perfluorocyclohexyl potassium sulfonate.

4,411,745
ELECTROLYTIC INITIATION OF POLYMERIZATION IN AQUEOUS TWO-PHASE SYSTEMS

Lawrence E. Ball, Cuyahoga Falls; Martin A. Pichler, and V. Frances Gaylor, both of Parma, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Jan. 4, 1982, Ser. No. 336,534

Int. Cl.³ C25B *3/02, 3/00*

U.S. Cl. 204—59 R **22 Claims**

1. An indirect process for electrolytically initiating the polymerization of ethylenically unsaturated monomer(s) by passing an electrical current through a two-phase system comprising: (a) a discontinuous organic phase, (b) a continuous aqueous phase capable of carrying an electric current, (c) a free radical source capable of forming a polymerization initiator, and (d) an electron transfer agent.

4,411,746
PREPARATION OF ALKYL-SUBSTITUTED BENZALDEHYDES

Dieter Degner, Dannstadt-Schauernheim; Hans Roos, Bad Durkheim, and Heinz Hannebaum, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

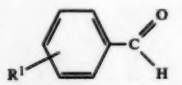
Filed Jul. 22, 1982, Ser. No. 400,699

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1981, 3132726

Int. Cl.³ C25B *3/02, 11/06*

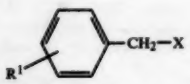
U.S. Cl. 204—59 R **1 Claim**

1. In a process for preparing an alkyl-substituted benzaldehyde of the formula



I

wherein R^1 is hydrogen, alkyl or aryl by electrooxidation of an alkylbenzene derivative of the formula



II

wherein

R^1 is as defined above,

X is hydrogen, hydroxy or R^2COO^-, and

R^2 is hydrogen or alkyl,

in water or an alkanoic acid, the improvement which comprises: conducting the electrooxidation using graphite anodes coated with a metal oxide or carbide selected from the group consisting of ruthenium oxide, titanium dioxide, iron oxide, chromium oxide, cobalt oxide, manganese dioxide, nickel oxide or tungsten carbide.

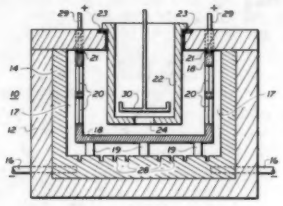
4,411,747
PROCESS OF ELECTROLYSIS AND FRACTIONAL CRYSTALLIZATION FOR ALUMINUM PURIFICATION

Robert K. Dawless, Monroeville; Kenneth A. Bowman, Leechburg; Robert M. Mazgaj, Lower Burrell, and C. Norman Cochran, Oakmont, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Aug. 30, 1982, Ser. No. 412,833

Int. Cl.³ C25C *3/06;* **C22B** *21/02*

U.S. Cl. 204—67 **10 Claims**



1. An improved process for purifying aluminum containing impurities, comprising:

(a) introducing aluminum that contains impurities to a charging chamber associated with an electrolytic cell of the type having a porous diaphragm located in and permeable by the electrolyte of the cell, and impermeable to aluminum;

(b) supplying impure aluminum from the chamber to an anode area of the cell;

(c) electrolytically transferring aluminum from the anode area to the cathode of the cell through said diaphragm while leaving impurities in the anode area, thereby purifying the aluminum introduced into the container;

(d) collecting purified aluminum at the cathode;

(e) lowering the level of eutectic impurities concentrated in the anode area due to said electrolytic transfer by subjecting molten aluminum and impurities in said chamber to a fractional crystallization treatment to concentrate eutectic impurities thereby providing separation of such impurities from aluminum, the aluminum being suited for further purification, as provided in step (c); and

(f) removing the eutectic impurities from the chamber.

4,411,748
ANODE AND PROCESS FOR MAGNESIUM PRODUCTION

Jay A. Harvey, Calcutta, India, assignor to Great Lakes Carbon Corporation, New York, N.Y.

Filed Sep. 18, 1981, Ser. No. 303,635

Int. Cl.³ C25C *3/04, 7/02*

U.S. Cl. 204—70 **9 Claims**

5. A method for the production of magnesium by the Dow process in an electrolytic cell having at least one anode and an essentially air tight seal through which said anode passes, wherein said anode comprises a graphite body having an essentially impermeable coating thereon at least in the region above said seal, said coating being selected from the group consisting of magnesium and magnesium-aluminum alloy.

4,411,749

PROCESS FOR ELECTROLYZING AQUEOUS SOLUTION OF ALKALI METAL CHLORIDE

Kimihiko Sato; Yasuo Sajima; Makoto Nakao, and Takeshi Morimoto, all of Yokohama, Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

Filed Aug. 20, 1981, Ser. No. 294,786
Claims priority, application Japan, Aug. 29, 1980, 55-118461
Int. Cl.³ C25B 1/34
U.S. Cl. 204—98 3 Claims

1. A process for electrolyzing an aqueous solution of an alkali metal chloride by feeding said aqueous solution of an alkali metal chloride into the central space of a hollow quadrilateral frame holding an anode therein, defining an anode compartment, and feeding water or a dilute aqueous solution of an alkali metal hydroxide into the central space of a hollow quadrilateral frame holding a cathode therein, defining a cathode compartment, said anode compartment and said cathode compartment being separated by a cation exchange membrane, in a filter-press type electrolytic cell wherein:

(a) each hollow quadrilateral frame is provided with an inlet passage to the central space of said frame for the introduction of an electrolyte and an outlet passage from the central space of said frame for removal of an electrolyzed product;

(b) an anode or a cathode is held in each said frame and electrically connected to a power source or an adjacent counter electrode, each said anode or cathode being respectively made of a metal plate having at the central part thereof notched rectangular portions being alternately bent to project in parallel to said metal plate and displaced therefrom, said notched rectangular portions being defined by adjacent longitudinal parallel cuts through said metal plate; and

(c) a gas and liquid permeable non-electrode porous layer made of inorganic particles is formed on the cation exchange membrane in a thickness thinner than that of the membrane on at least one surface of said membrane, wherein said at least one surface of the cation exchange membrane having the porous layer thereon is separated from the anode or cathode facing said porous layer.

4,411,750

CATION EXCHANGE MEMBRANE WITH HIGH EQUIVALENT WEIGHT COMPONENT

Raimund H. Silva, Hattingen, Fed. Rep. of Germany, and Roger A. Smith, Kennett Square, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 317,280, Nov. 2, 1981, and a continuation-in-part of Ser. No. 225,652, Jan. 16, 1981, abandoned. This application Sep. 20, 1982, Ser. No. 420,509
Int. Cl.³ C25B 1/34, 9/00, 13/08
U.S. Cl. 204—98 5 Claims

1. In a process for the continuous production of alkali metal hydroxide which comprises continuously providing an aqueous alkali metal halide solution to the anode compartment of an electrolytic cell having an anode, a cathode, and a cation exchange membrane separating the anode and the cathode; electrolyzing the solution; and continuously removing alkali metal hydroxide solution, hydrogen, and halogen from the electrolytic cell, the improvement wherein the cation exchange membrane consists essentially of layers of

(a) fluorinated polymer with pendant side chains containing carboxyl groups,

(b) fluorinated polymer having pendant side chains containing sulfonyl groups and having an equivalent weight of about from 1100 to 1600 and at least about 200 units higher than layer (a), and

(c) fluorinated polymer having pendant side chains containing sulfonyl groups and having an equivalent weight that is about from 1000 to 1500 and at least about 100 units lower than layer (b), the layers being bonded together in the order specified.

4,411,751

METHOD OF ANODICALLY DEBURRING ARTICLES OF STEEL OR ALUMINIUM ALLOYS IN AN ELECTROLYTIC BATH, AND A BATH FOR CARRYING OUT THE METHOD

Karl-Ingemar Blomsterberg, Högstensgatan 60, 423 00 Torslanda, Sweden

PCT No. PCT/SE82/00011, § 371 Date Sep. 14, 1982, § 102(e) Date Sep. 14, 1982, PCT Pub. No. WO82/02407, PCT Pub. Date Jul. 22, 1982
PCT Filed Jan. 15, 1982, Ser. No. 420,252
Int. Cl.³ C25F 3/04, 3/06
U.S. Cl. 204—129.85 10 Claims

1. A method of anodically deburring articles of steel or aluminium alloys in an electrolytic bath containing, in addition to water, alkali sulphamate, at least one polyhydric alcohol and at least one soluble chloride, at a bath voltage of 5 to 30 volts and a current density of 2 to 50 amperes per square decimeter, carried out in an acid solution having a pH not exceeding 6.5 and containing

	grams per liter
water	100 to 300
alkali sulphamate	50 to 150
polyhydric alcohol	400 to 800
alkali nitrate	50 to 150
alkali chloride	50 to 150.

4,411,752

PREPARATION OF 1-MONOCHLOROETHYLCARBAMYL CHLORIDE

Karl-Heinz Koenig, Frankenthal, and Karl-Heinz Feuerherd, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Mar. 26, 1981, Ser. No. 247,984
Claims priority, application Fed. Rep. of Germany, Apr. 5, 1980, 3013270
Int. Cl.³ B01J 19/12
U.S. Cl. 204—158 HA 9 Claims

1. A process for producing 1-monochloroethylcarbamyl chloride as the principal product and in high yields which comprises reacting ethyl isocyanate or ethylcarbamyl chloride with chlorine at from −78° to 0° C., under exposure to light.

4,411,753

SYNTHESIS OF 6-T-ALKYL-3-PYRIDAZINONES

Riaz F. Abdulla, Greenfield, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

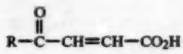
Filed Apr. 8, 1982, Ser. No. 366,882
Int. Cl.³ C07D 237/14
U.S. Cl. 204—158 R 12 Claims

1. A process for preparing a pyridazinone of formula

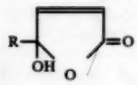
wherein
R is of the formula

(I)

R^1 is C_1–C_4 alkyl;
R^2 and R^3 are independently C_1–C_{13} alkyl, or halo-C_1–C_{13} alkyl;
n is 0–4;
comprising irradiating a 2-propenoic acid of the formula



to form a furanone of the formula



and reacting the furanone with hydrazine.

4,411,754

PROCESS FOR PREPARING A POLYMER COMPOSITION

Isao Kaetsu; Masaru Yoshida, and Minoru Kumakura, all of Takasaki, Japan, assignors to Japan Atomic Energy Research Institute, Tokyo, Japan

Continuation of Ser. No. 18,617, Mar. 8, 1979. This application Feb. 13, 1981, Ser. No. 234,839

Claims priority, application Japan, Mar. 9, 1978, 53-27109; Apr. 28, 1978, 53-51239; Aug. 29, 1978, 53-105306; Aug. 30, 1978, 53-106097

The portion of the term of this patent subsequent to Mar. 23, 1999, has been disclaimed.

Int. Cl.³ C08G *2/46*; A61K *9/22*

U.S. Cl. 204—159.15 **2 Claims**

1. A process for preparing a polymer composition containing a physiologically active substance, said composition capable of releasing said physiologically active substance at a controlled rate, characterized by mixing one or more polymerizable monomers and said physiologically active substance in the absence or presence of a crystallizable substance, intended to increase the surface area for elution of said substance, and wherein an adsorbent is added from the group consisting of active carbon, silica-gel, kaolin and ion exchange resins, to adsorb a solution of physiologically active substance when an elution medium permeates into the composition, and irradiating the resulting mixture with light or an ionizing radiation at a temperature below 0° C. to polymerize said polymerizable monomers, to yield said polymer composition.

4,411,755

LASER-ASSISTED ISOTOPE SEPARATION OF TRITIUM

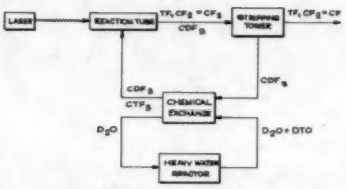
Irving P. Herman, Castro Valley, and Jack B. Marling, Livermore, both of Calif., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Nov. 28, 1980, Ser. No. 210,716

The portion of the term of this patent subsequent to Mar. 24, 1998, has been disclaimed.

Int. Cl.³ B01D *59/00*

U.S. Cl. 204—163 R **23 Claims**



1. A method for isotope separation of tritium-bearing molecules from heavy water reactor coolants in a molecular mixture, the method comprising the steps of:

providing an initial fluid containing an isotope mixture of deuterium-containing molecules D_2O and tritium-containing molecules DTO;

catalytically reacting the initial fluid with deuterium-containing working molecules XYD, where the working molecule XYD is a doubly-halogenated or triply halogenated methane molecule, in an exchange reaction $DTO+XYD \rightarrow D_2O+XYT$ to obtain product molecules XYT;

irradiating the product molecules XYT and the working molecules XYD with a pulsed infrared laser, tuned to a frequency that is photoselectively absorbed by XYT but not by XYD, so that the XYT molecules absorb a large number $n(\geqq 20)$ of laser photons of frequency ν and dissociate according to the reaction $XYT+n\hbar\nu \rightarrow X+YT$; and

chemically separating the molecules YT from the other molecules in the molecular mixture.

4,411,756

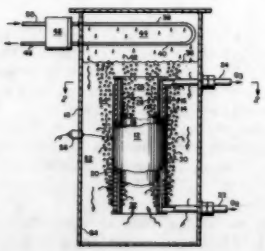
BOILING COOLANT OZONE GENERATOR

Douglas L. Bennett, Macungie, and Donald C. Amoss, Quakertown, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Mar. 31, 1983, Ser. No. 481,026

Int. Cl.³ C01B *13/11*

U.S. Cl. 204—176 **29 Claims**



1. In an apparatus for producing ozone from an oxygen-containing gas by corona discharge, comprising two spaced electrodes supplied by a high voltage, and means for cooling the ozone by contacting an electrode with a coolant, the improve-

ment comprising means for effecting the boiling of the coolant utilizing the heat in the generator whereby the resulting boiling coolant fluid contacts at least one electrode in heat exchange communication so as to enhance the heat transfer capability and to extend the life of the apparatus.

4,411,757

FORMATION OF ELECTRODES FOR MAGNETORESISTIVE SENSOR

Masahiro Kitada, Hamuramachi; Masahide Suenaga; Yukihisa Tsukada, both of Odawara; Noboru Shimizu, Tokorozawa, and Hiroshi Yamamoto, Hamuramachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 8, 1982, Ser. No. 386,302

Claims priority, application Japan, Jun. 10, 1981, 56-88148

Int. Cl.³ C23C *15/00*

U.S. Cl. 204—192 E **9 Claims**

1. A method of forming electrodes for a magnetoresistive sensor comprising the steps of

(a) providing a mask of a predetermined pattern on a double-layer structure comprising a Mo film of which at least a portion is formed on a magnetoresistive film and an Al or Al alloy film deposited on said Mo film;

(b) exposing said Al or Al alloy film to an etching environment to etch at least said Al or Al alloy film into said predetermined pattern; and

(c) processing, after the completion of said step (b), at least said Mo film to have a pattern corresponding to that of said Al or Al alloy film by a plasma etching or reactive sputter etching technique.

4,411,758

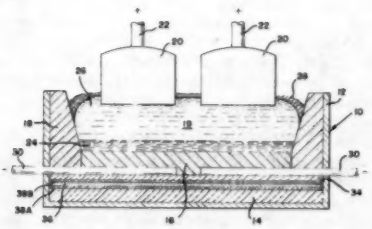
ELECTROLYTIC REDUCTION CELL

James B. Hess, Dublin, and Erwin O. Strahl, San Ramon, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Sep. 2, 1981, Ser. No. 298,555

Int. Cl.³ C25C *3/08*

U.S. Cl. 204—243 R **8 Claims**



1. In a Hall-Heroult-type electrolytic cell containing a molten salt electrolyte composed primarily of fluoride salts and having dissolved in the molten electrolyte alumina which is electrolytically reduced to aluminum metal during the operation of the electrolytic cell, said cell comprising a steel shell, a layer of insulating material on at least the bottom of the shell and a layer of electrically conducting carbonaceous material disposed on at least the insulating layer on the bottom of the shell, the improvement comprising a composite strata interposed between the layer of insulating material and the layer of carbonaceous material on the bottom of the shell, said strata containing at least one layer of ground glass which melts and forms a high melting point barrier layer during the operation of the cell, the high melting point barrier preventing the penetration of electrolyte components, sodium vapor and gaseous fluorides into the insulating layer beneath the glass layer and at least one layer of a high temperature resistant layer wettable by the molten glass which maintains the molten glass in a continuous layer until the glass forms the high melting point barrier.

4,411,759

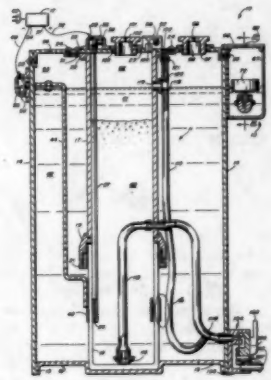
ELECTROLYTIC CHLORINE GENERATOR

Paul D. Olivier, 4851 E. Fanfol Dr., Scottsdale, Ariz. 85253

Filed Feb. 4, 1982, Ser. No. 345,566

Int. Cl.³ C25B *9/00, 11/03, 11/04, 13/04*

U.S. Cl. 204—260 **11 Claims**



1. An electrolytic cell for the generation of gaseous chlorine comprising:

a cathode chamber,

an anode chamber for receiving therein an aqueous solution of a metallic chloride,

the walls of said anode chamber separating said cathode chamber from said anode chamber being at least partially formed of a porous ceramic material which extends into both cathode chamber and the anode chamber,

an anode mounted in said anode chamber extending into the aqueous solution when it is placed therein,

a cathode in said cathode chamber deposited on said ceramic material in said cathode chamber and being in communication with said anode chamber through pores in said ceramic material,

said cathode comprising a porous metallic coating deposited on said ceramic material and having a porosity greater than the porosity of said ceramic material,

means for supplying a DC voltage across said anode and said cathode to produce gaseous chlorine in said anode chamber; and

an outlet in each chamber.

8. An electrolytic cell comprising:

an anode compartment,

a cathode compartment,

an anode positioned in said anode compartment,

a porous separator defining an area between said compartments,

a cathode deposited on the surfaces of said separator within said cathode compartment juxtapositioned to said anode,

said cathode comprising a flame and/or plasma deposited porous metallic coating applied directly to the surface of said area of said porous separator material, and

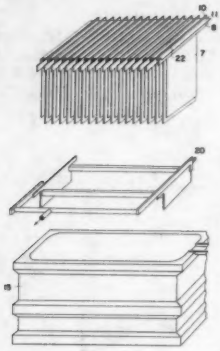
an outlet in each compartment.

4,411,760

ELECTROLYTIC CELLS

Renato Guerriero, and Italo Vittadini, both of Mestre, Italy, assignors to SAMIM Societa Azionaria Minero Metallurgica S.p.A., Rome, Italy

Filed May 13, 1981, Ser. No. 263,207
Claims priority, application Italy, May 26, 1980, 22313 A/80
Int. Cl.³ C25C 7/00, 1/16, 7/02
U.S. Cl. 204—270 5 Claims



1. An electrochemical cell having an electrolyte-containing container and a set of spaced anodes and cathodes arranged in alternate sequence and serially connected, comprising:

bus bars for the anodes and cathodes, wherein the anodes and cathodes depend directly from said bars,

a support structure at the top of the container and about its perimeter upon which said bus bar rest so that said bars are at the top of the container with the anodes and cathodes depending directly therefrom into the electrolyte,

a plurality of shielding baffles which are resilient and which are secured to the top of said bus bars for the anodes,

said baffles extend over and from both sides of the bus bars into the space between anodes to form gaps therebetween in which said cathode bus bars are positioned, and wherein said baffles and cathode bus bars isolate the space immediately above the electrolyte, and said baffles, due to their resiliency and inter anode gaps, allow removal and replacement of the cathode while they remain secured to the anodes,

a suction manifold connected to said tub having a plurality of ports spaced along its length and open to the space between said baffles and electrolyte for drawing gases and mists therefrom, and

suction means connected to said manifold which effect a negative pressure in said manifold relative to the pressure in the room to draw out gases and mists which evolve in the electrochemical reaction from said space and through said ports to prevent their diffusion into the room.

4,411,761

SPINEL-CONTAINING ELECTRODE AND PROCESS FOR ITS PRODUCTION

Hans Roos, Bad Durkheim; Hugo Böehn, Ludwigshafen; Knüt Bittler, Speyer; Volker Kiener, Weisenheim, and Gerd Wunsch, Speyer, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Jun. 24, 1981, Ser. No. 276,985
Claims priority, application Fed. Rep. of Germany, Jun. 28, 1980, 3024611
Int. Cl.³ C25B 1/26, 11/04
U.S. Cl. 204—290 R 2 Claims

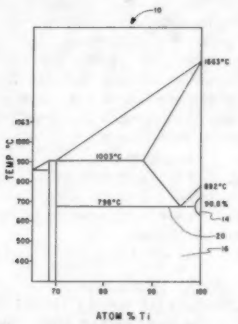
1. An electrode of which at least the outer electrochemically active layer contains spinels, wherein the spinels consist of a mixture of the individual spinels of said iron and said cobalt, Fe_3O_4 and Co_3O_4 spinels being from 30:70 to 90:10.

4,411,762

TITANIUM CLAD COPPER ELECTRODE AND METHOD FOR MAKING

George A. Kline, Madison, Ohio, assignor to Diamond Shamrock Corporation, Dallas, Tex.

Filed Nov. 9, 1981, Ser. No. 319,702
Int. Cl.³ C25B 11/00; C25D 3/66
U.S. Cl. 204—290 F 29 Claims



1. A method for making an electrode for use in an electrochemical cell comprising the steps of:

selecting a substrate metal material and a valve metal material;

immersing the substrate in a fused salt electrolyte bath including the valve metal;

making the substrate metal cathodic whereby the valve metal is caused to electrodeposit upon the substrate;

controlling the temperature of the bath to be at least 550° C. and not greater than the alpha-beta transition temperature for the intermetallic of the substrate metal with the valve metal material;

discontinuing electrodeposition when the thickness of the thereby electrodeposited valve metal coating is not greater than 10 mils;

performing the electrodeposition in an inert atmosphere;

maintaining a current density of not greater than about 100 milliamperes per square centimeter at the substrate during electrodeposition; and

applying an electrocatalyst to the valve coated metal substrate.

27. An electrode for use in an electrochemical cell such as an electrolytic halogen generation cell comprising: an electrically conductive metal substrate, the conductive metal being selected from a group consisting of copper, nickel, iron, silver, gold, platinum and mixtures thereof; an electrodeposited valve metal cladding the substrate, the valve metal being selected from a group consisting of titanium, niobium, zirconium, tungsten, tantalum, bismuth and mixtures thereof; an interdiffused zone of substrate metal and valve metal between the cladding and substrate; and an electrocatalyst applied to surface portions of the cladding; the valve metal cladding being substantially free of the substrate metal and not greater than about 10 mils in thickness, the substrate metal being substantially free of the valve metal.

4,411,763

SPUTTERING APPARATUS

Takeshi Itaba; Akio Nishiyama, both of Tokyo; Noribumi Kikuchi, Ohmiya; Takayuki Shingyoji, Ohmiya, and Yuzo Ohsawa, Ohmiya, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1982, Ser. No. 411,003
Claims priority, application Japan, Aug. 27, 1981, 56-134502
Int. Cl.³ C23C 15/00
U.S. Cl. 204—298 14 Claims

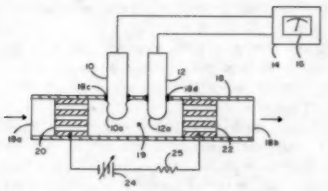
1. A sputtering apparatus for applying a coating to an article which apparatus comprises:
(a) vacuum chamber;
(b) a holding means disposed within the vacuum chamber for holding the article; and
(c) a target cathode disposed within the vacuum chamber, the target cathode being of a tubular skeleton structure disposed in surrounding relation to the article holding means.

4,411,764

HYDROGEN ION INTERFERENT REDUCTION SYSTEM FOR ION SELECTIVE ELECTRODES

John N. Harman, III, Pasadena, and Robert H. Jones, Irvine, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Nov. 13, 1981, Ser. No. 321,297
Int. Cl.³ G01N 27/28
U.S. Cl. 204—411 15 Claims



1. In an analyzer of the type having an ion selective electrode that is adapted to measure the activity of sodium, potassium or ammonium ions and a reference electrode, the improvement comprising:
(a) an anode electrode,
(b) a cathode electrode,
(c) an enclosure for directing a flow of an aqueous sample past the anode and the cathode electrodes,
(d) means for applying between the anode and cathode electrodes a voltage sufficient to cause the generation of hydroxyl ions at the cathode electrode,
(e) means for positioning the ion selective electrode and the reference electrode in a region having a local excess hydroxyl ion concentration.

4,411,765

METHOD FOR LIQUEFYING LOW RANK COAL

Yoshio Matsuura, Funabashi; Michio Kurihara, Mitaka; Takao Kamei, Ashiya; Akira Nakamura; Keiichi Komai, both of Akashi, and Takeshi Wakabayashi, Kobe, all of Japan, assignors to Electric Power Development Co., Tokyo and Kawasaki Kabushiki Kaisha, Kobe, both of, Japan

Filed Feb. 10, 1982, Ser. No. 347,422
Int. Cl.³ C10G 1/00
U.S. Cl. 208—8 LE 5 Claims

1. Method for liquefying low rank coal which comprises steps of providing a water-coal slurry by mixing crushed coal with water, heating the slurry under a pressure to a temperature which is lower than the saturation temperature under the pressure to thereby remove water from the coal in the liquid phase, separating liquid in the slurry from the solids, performing heat exchange between the separated liquid and the said pressurized water-coal slurry, then mixing the liquid with crushed coal to provide a further water-coal slurry, mixing the separated solids with a solvent to provide a fluid, evaporating the water content of the fluid, cooling the evaporated water to thereby condense it so as to recover volatile material, heating and pressurizing a residual part of the fluid to a temperature and pressure suitable for liquefaction reaction with addition of hydrogen to obtain a liquefaction reactant, then subjecting the reactant to a heat exchange with the water-coal slurry to cool the reactant to a temperature suitable for distillation, and recirculating at least a part of the liquefaction reactant so that it is used as at least a part of the solvent.

4,411,766

IRON CATALYZED COAL LIQUEFACTION PROCESS

Diwakar Garg, Macungie, and Edwin N. Givens, Bethlehem, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Feb. 25, 1982, Ser. No. 352,282
Int. Cl.³ C10G 1/06
U.S. Cl. 208—10 10 Claims

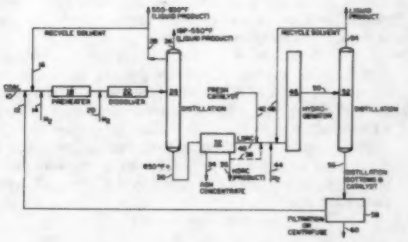
1. A process for the catalytic solvent refining of coal to generate liquid hydrocarbons, hydrocarbon gas and normally solid dissolved coal from the feed coal wherein particulate coal in a suspension of hydrogen donor coal solvent is reacted in a reducing atmosphere in the presence of a combination of co-catalysts of iron oxide and pyrite in which the iron as iron oxide is in a stoichiometric excess of that needed to react with substantially all sulfur available in-situ in the reaction medium so as to product additional iron sulfide catalyst, to eliminate substantially all of the hydrogen sulfide in the reactor effluent and to increase the liquid hydrocarbon content of the product distribution.

4,411,767

INTEGRATED PROCESS FOR THE SOLVENT REFINING OF COAL

Diwakar Garg, Macungie, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Sep. 30, 1982, Ser. No. 429,390
Int. Cl.³ C10G 1/08
U.S. Cl. 208—10 7 Claims



1. A process for the catalytic solvent refining of coal into liquid and solid products with the subsequent catalytic hydrogenation of at least a portion of the solid coal product to produce additional liquid product comprising the steps of:
(a) contacting particulate coal with a normally liquid solvent and a catalyst for the solvent refining of coal to form an unsupported hydrogenation coal slurry;
(b) catalytically solvent refining the coal slurry at elevated temperature and pressure in an initial process stage to form a liquid product containing normally solid refined coal;
(c) separating the liquid product into a lower boiling liquid

product and a normally solid refined coal product containing spent catalyst and ash;

(d) separating the normally solid refined coal from the spent catalyst and ash;

(e) contacting the normally solid refined coal with a fresh unsupported hydrogenation catalyst and introducing the mixture into a hydrogenation zone;

(f) hydrogenating the normally solid refined coal at elevated temperature and pressure to produce additional liquid product;

(g) separating the liquid product of step (f) from a residual product containing the used hydrogenation catalyst;

(h) recycling the used hydrogenation catalyst to the solvent refining contact stage of step (a) as the solvent refining catalyst.

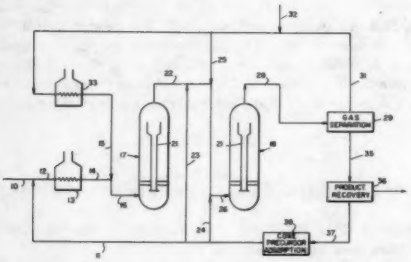
4,411,768
HYDROGENATION OF HIGH BOILING HYDROCARBONS

Harold Unger, Fort Lee, N.J.; Morgan C. Sze, Portsmouth, N.H., and Roger P. Van Driesen, Titusville, N.J., assignors to The Lummus Company, Del.

Continuation-in-part of Ser. No. 272,720, Jun. 11, 1981, abandoned, which is a continuation of Ser. No. 106,274, Dec. 21, 1979, abandoned. This application Apr. 21, 1982, Ser. No. 370,416

Int. Cl.³ C10G *47/26, 47/36*

U.S. Cl. 208—59 **6 Claims**



1. In a process for upgrading high boiling hydrocarbon materials to valuable lower boiling materials is a hydrogenation operation including at least one expanded bed catalytic hydrogenation zone to produce an upgraded hydrogenated product, the improvement comprising:

recovering from the upgraded hydrogenation product a recycle liquid having a 5-volume percent distillation temperature of at least 450° F. with at least 25-volume percent thereof boiling above 950° F.; cooling the liquid recycle to a temperature of at least 350° F. and no greater than 700° F. to separate coke precursors from the liquid recycle; and subsequent to separation of said coke precursors providing the liquid recycle to an expanded bed catalytic hydrogenation zone.

4,411,769
INTEGRATED TWO STAGE COKING AND STEAM CRACKING PROCESS AND APPARATUS THEREFOR

Morey E. Oldweiler, Chester, N.J., assignor to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 23, 1982, Ser. No. 360,927

Int. Cl.³ C10G *9/32*

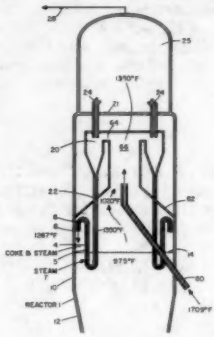
U.S. Cl. 208—54 **9 Claims**

1. In an integrated two stage coking and steam cracking process for the production of products including low molecular weight unsaturated hydrocarbons in which

(a) a carbonaceous material is reacted in a reactor in a first stage coking zone containing a bed of fluidized solids wherein steam is present maintained at fluid coking conditions including a temperature in the range of about 950° F. to about 1150° F. to form a vaporous coking zone conversion product and coke, said coke depositing on said fluidized solids;

(b) said vaporous coking zone conversion product is passed with entrained solids into a dilute phase to a second stage reaction zone;

(c) hot solids at a sufficient temperature and in sufficient amount are introduced into said conversion product entering said second stage reaction zone to raise the conversion product to steam cracking temperatures within the range



of 1200° F. to 1700° F. and supply the endothermic heat of reaction; and

(d) solids are separated from product gas in a gas-solids separation zone, separated solids are passed to the coking zone and separated gas is quenched, the improvement which comprises:

(e) introducing relatively low temperature steam into contact with said separated solids before they enter the coking zone to superheat the steam and cool the solids, discharging the resulting mixture into the dilute phase wherein the cooled solids are passed into the coking zone.

4,411,770
HYDROVISBREAKING PROCESS

Nai Y. Chen, Titusville; Eric J. Scott, Princeton, and David S. Shihabi, Pennington, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 16, 1982, Ser. No. 369,330

Int. Cl.³ C10G *47/20*

U.S. Cl. 208—111 **10 Claims**

1. A process for enhancing the hydroconversion of a heavy hydrocarbon oil having a Conradson Carbon Residue content between about 8–30 weight percent, which process comprises (1) contacting the heavy hydrocarbon oil with hydrogen and a catalyst in a hydrovisbreaking zone at a temperature between about 650°–850° F. and a pressure between about 200–2000 psi and a liquid hourly space velocity between about 0.1–5, wherein said catalyst comprises (a) a crystalline zeolite component having a silica/alumina ratio greater than about 12, and an acid activity less than about 10 on the Alpha Scale, and (b) a metallic hydrogenation component; and (2) recovering and fractionating the visbroken effluent to provide distillate products and a 1000° F.+ fraction which has a Kinematic Viscosity between about 30,000–60,000 centistokes at 100° F.

4,411,771

PROCESS FOR HYDROTREATING HEAVY HYDROCARBONS AND CATALYST USED IN SAID PROCESS

William E. Bambrick, Old Greenwich, and Marvin S. Goldstein, Norwalk, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 209,776, Dec. 24, 1980, abandoned. This application Nov. 30, 1981, Ser. No. 325,699

Int. Cl.³ B01J *21/04, 23/24, 23/85*

U.S. Cl. 208—112 **25 Claims**

1. Hydrotreating catalyst comprising at least one catalytic metal selected from group VI and, optionally, at least one promoter metal selected from Group VIII of the periodic table, on catalyst support particles consisting essentially of spherical alumina beads consisting essentially of 70 to 100% by wt of alumina that has been rehydrated from partially dehydrated alumina in the forming of said beads and has then been calcined to convert the alumina to essentially anhydrous alumina, said beads having average particle diameter in the range from about 0.1 to 1 mm, and total pore volume in the range from 0.75 to 1.3 ml/gm with 0.3 to 0.6 ml/gm of said pore volume in pores having radius less than 105 Angstroms.

4,411,772

FLUID COKING WITH THE ADDITION OF PEROVSKITE-CONTAINING CATALYSTS

Robert C. Schucker, and Kenneth S. Wheelock, both of Baton Rouge, La., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Feb. 24, 1982, Ser. No. 351,968

Int. Cl.³ C10G *11/02, 47/02*

U.S. Cl. 208—121 **8 Claims**

1. In a fluid coking process comprising the steps of: contacting a carbonaceous chargestock having a Conradson carbon content of at least about 5 weight percent with hot fluidized solids in a fluidized coking bed contained in a coking zone maintained in a fluidized state by the introduction of a fluidizing gas and operated at coking conditions, including a temperature ranging from about 850° to about 1,400° F., to produce a vapor phase product and a solid carbonaceous material which deposits on said fluidized solids, the improvement which comprises the presence of a cracking catalyst in said cooking zone in a weight ratio of said catalyst to said carbonaceous feed ranging from about 0.1:1 to about 1:1, said cracking catalyst comprising a perovskite having at least one transition metal cation selected from the group consisting of elements having atomic numbers ranging from 21 through 30, from 39 through 48, from 57 through 80 and from 89 through 92.

4,411,773

HEAT BALANCE IN FCC PROCESS AND APPARATUS WITH DOWNFLOW REACTOR RISER

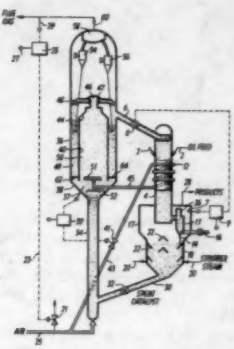
Benjamin Gross, Cherry Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 217,879, Dec. 18, 1980, Pat. No. 4,356,082. This application Jul. 30, 1982, Ser. No. 403,685

Int. Cl.³ F27B *15/10, 15/14, 15/16*

U.S. Cl. 208—164 **38 Claims**

1. A fluid catalytic cracking process comprising admixing a hydrocarbonaceous feed with a regenerated catalyst in the top section of a downflow reactor riser, passing the hydrocarbonaceous feed and the catalyst admixed therewith through the downstream section of the riser, thereby effecting cracking of the hydrocarbonaceous feed at the process temperature under endothermic process conditions and deactivating the catalyst by deposition of carbonaceous deposits thereon, separating the deactivated catalyst from the cracked hydrocarbonaceous feed, passing the deactivated catalyst to a regenerator vessel wherein the carbonaceous deposits are removed from the deactivated catalyst under exothermic process conditions by means of a regenerating medium introduced into the regenerator vessel by a regenerating medium distribution means, thereby regenerating and heating the catalyst, passing the regenerated hot catalyst to the top section of the downflow reactor riser, and transferring at least a portion of the thermal



energy by heat exchanging means from the downflow riser to the regenerator vessel.

4,411,774

PROCESS FOR REMOVING CONTAMINANTS FROM WASTE LUBRICATING OIL BY CHEMICAL TREATMENT

Conrad B. Johnson, Edmonton, Canada, assignor to Turbo Resources Ltd., Edmonton, Canada

Continuation-in-part of Ser. No. 225,792, Jan. 16, 1981, abandoned. This application Mar. 5, 1982, Ser. No. 354,955

Int. Cl.³ C16M *11/00*

U.S. Cl. 208—179 **6 Claims**

1. A process for removing contaminants from waste lubricating oil, said contaminants arising from detergent dispersant agents and the wear of mechanical parts, comprising the steps of:

contacting the waste lubricating oil in the absence of added water with a pretreatment chemical selected from the group consisting of ammonium sulphate, ammonium bisulphate, ammonium dihydrogen phosphate, phosphoric acid, calcium sulphate, aluminum sulphate, magnesium sulphate, sodium sulphate and mixtures thereof, at a temperature in the range of about 650° F. to 725° F. for a time sufficient to render the greatest part of the contaminants removable by filtration; and then

filtering the oil mixture to obtain a filtrate product reduced in contaminant content.

4,411,775

DEMULSIFICATION OF BITUMEN EMULSIONS USING WATER SOLUBLE EPOXY-CONTAINING POLYETHERS

David R. McCoy; Michael Cuscurida, and George P. Speranza, all of Austin, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Dec. 2, 1981, Ser. No. 326,460

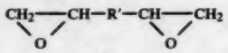
Int. Cl.³ C10G *33/04*

U.S. Cl. 208—188 **5 Claims**

1. A process for recovering petroleum from oil-in-water (O/W) bitumen emulsions by demulsifying said emulsions comprising contacting the emulsions at a temperature of from between about 25° and 160° C. with water soluble polyethers prepared from the acid- or base-catalyzed reaction of poly-(ethyleneoxy) glycols of the structure

$$HO(CH_2CH_2O)_nH$$

where n=40 to 250 with 0.5–10 wt.% diepoxides of ≦600 molecular weight of the general structure



wherein R′ is an aromatic group.

4,411,776

METHOD FOR TREATING MERCAPTANS CONTAINED IN A SOUR PETROLEUM DISTILLATE

David H. J. Carlson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.

Division of Ser. No. 255,409, Apr. 4, 1981, Pat. No. 4,364,843, which is a continuation-in-part of Ser. No. 95,748, Nov. 19, 1979, abandoned, and Ser. No. 98,009, Nov. 28, 1979, abandoned. This application Sep. 16, 1982, Ser. No. 418,953

Int. Cl.³ C10G *19/073*

U.S. Cl. 208—206 **11 Claims**

1. A method of treating a mercaptan-containing sour petroleum distillate by contacting said distillate at oxidation conditions with a catalytic composite comprising a catalytically effective amount of a metal phthalocyanine and an alkali metal hydroxide disposed on an adsorptive support, said alkali metal hydroxide comprising at least about 10 wt. % of said catalytic composite, said catalytic composite being prepared by a method which comprises:

(a) preparing an admixture of an adsorptive support, a metal phthalocyanine, an alkali metal hydroxide, and an alcohol having fewer than six carbon atoms, said admixture also containing from 0 wt. % to about 25 wt. % water based on the weight of said alcohol; and

(b) drying said admixture at a temperature of less than about 30° C. to form a catalytic composite.

4,411,777

PRODUCING INCREASED YIELD OF HYDROGEN BY CRACKING PETROLEUM WITH POTASSIUM-CONTAINING CATALYST

Dwight L. McKay, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 934,925, Aug. 18, 1978, Pat. No. 4,331,563. This application Feb. 4, 1982, Ser. No. 345,516

Int. Cl.³ C10G *11/05, 11/18*

U.S. Cl. 208—120 **8 Claims**

1. A process for producing hydrogen and a high gasoline yield but without significantly increasing coke production which comprises cracking a petroleum hydrocarbon or oil under cracking conditions suited to produce high gasoline yields by subjecting said hydrocarbon or oils to said cracking conditions in the presence of a petroleum cracking catalyst containing at least one of the metals iron, nickel and vanadium and also containing potassium in the range of from about 0.01 to about 0.05 weight percent of the catalyst, calculated as the element.

4,411,778

APPARATUS FOR SCREENING GRAIN OR THE LIKE

D. L. Venable, 4110 11th Ave., Kearney, Nebr. 68847

Filed Oct. 2, 1981, Ser. No. 307,967

Int. Cl.³ B07B *1/40*

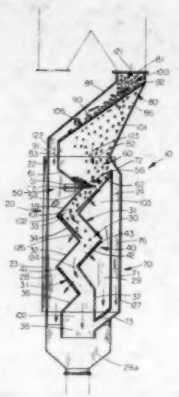
U.S. Cl. 209—246 **8 Claims**

1. An apparatus for screening grain or the like comprising:

a casing;

means for forming a vertical zig-zag chute within the casing for receiving gravity fed material to be screened, the underside of each zig and each zag having an opening for the passage of material therethrough to the bottom of the casing and the upperside thereof being of fixed angular relationship with respect to the walls of the casing;

means for hingedly connecting to the interior of said chute forming means, above each opening therein, a screen covering the opening whereby clean elements of the material to be screened will follow a zig-zag path through said chute forming means and cause each screen to resonate with respect to said hingedly connecting means, thereby further separating the fines therefrom, and whereby the clean elements will be discharged from said chute forming means and the fines from said casing.



4,411,779

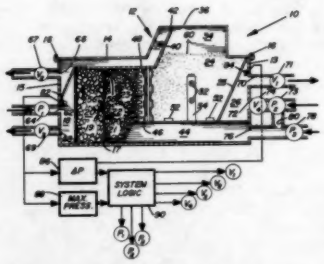
FLUID TREATMENT SYSTEM

Frank G. McConnell, III, 1440 Dineen Ave., Orlando, Fla.

Filed Apr. 24, 1978, Ser. No. 899,553

Int. Cl.³ B01D *23/24*

U.S. Cl. 210—108 **28 Claims**



1. A fluid treatment system, comprising:

an enclosed housing having an inlet at one end and an outlet at another end;

a filtration medium disposed in said housing for removing undesirable constituents in said fluid during passage between said inlet and said outlet;

means coupled to said inlet for pumping said fluid to be treated into said inlet and in a flow path between said inlet and said outlet;

backwashing means for introducing a cleansing fluid into said filtration medium;

first means disposed in said housing for measuring fluid pressure adjacent said inlet;

second means disposed in said housing for measuring fluid pressure adjacent said outlet;

means for detecting the pressure differential between said first and second pressure measuring means and providing an output when the pressure differential exceeds the selected level;

means for energizing said backwashing means responsive to said output from said pressure differential means;

a plurality of perforated partitions in said housing spaced between said inlet and said outlet and separating said housing into plural chambers, with said medium disposed in the first one of said chambers;

an expansion chamber above said first chamber;

means coupling said backwashing means with said housing and in communication with said first chamber, whereby said cleansing fluid expands said filtration medium upward in said first chamber and into a portion of said expansion chamber; and

a weir in said expansion chamber for removing said cleansing fluid therefrom.

4,411,780

SEWAGE DISPOSAL PLANT

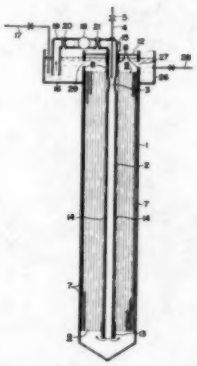
Kensuke Suzuki, Tokyo, and Sunao Okada, Nishinomiya, both of Japan, assignors to Nipon Sangyo Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 10, 1982, Ser. No. 347,436

Claims priority, application Japan, Feb. 19, 1981, 56/22382[U]

Int. Cl.³ C02F *3/04*

U.S. Cl. 210—150 **1 Claim**



1. A sewage disposal plant comprising a deep well type sewage treatment tank, a circulator pipe inserted vertically into the central portion of said sewage treatment tank and having a venturi portion at an intermediate section thereof, an air suction pipe inserted into said circulator pipe so as to open in said venturi portion thereof, an extension pipe fitted slidably up and down on a lower portion of said circulator pipe and connected to a winding pulley secured to an upper portion of said circulator pipe, a plurality of string-shaped contact members having therearound a number of ring type fuzzy hairs and provided in said sewage treatment tank in such a manner that said contact members are extended vertically in a tensile state between a pair of support frames fixed on upper and lower portions of the interior of said sewage treatment tank, a circulating water receiving tank for receiving therein untreated water so formed so as to be communicated with said sewage treatment tank at one side of an upper portion thereof, a water suction pipe extended outward from the interior of said circulating water receiving tank and communicated via a circulating pump provided at an intermediate portion thereof, with said circulator pipe at an upper portion thereof, first and second change-over valves inserted in said water suction pipe at both sides of said circulating pump, respectively, a by-pass pipe communicated via a third change-over valve with said water suction pipe at the downstream sides of said first and second change-over valves, a sludge discharge pipe having a fourth change-over valve at an intermediate portion thereof extending from a portion of said water suction pipe between said circulating pump and said second change-over valve, and a treated water receiving tank so formed as to be communicated with said sewage treatment tank at the other side of an upper portion thereof.

4,411,781

HIGH PRESSURE ULTRA-FILTRATION SYSTEM

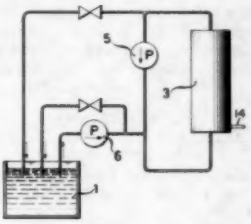
Roland Schnabel, Hofheim; Alexander Hoelzel, and Winfrid Vaulont, both of Mainz, all of Fed. Rep. of Germany, assignors to Jenaer Glaswerk Schott & Gen., Fed. Rep. of Germany

Filed Jan. 10, 1979, Ser. No. 2,371

Claims priority, application Fed. Rep. of Germany, Jan. 11, 1978, 2801018

Int. Cl.³ B01D *31/00*

U.S. Cl. 210—195.2 **8 Claims**



1. An apparatus for a high pressure ultra-filtration of a permeate from a crude solution at a pressure of 100 bars comprising a module; a plurality of pressure stable porous glass capillary diaphragms being stable at a pressure of 100 bars as a main filtration element; means for holding the glass capillary diaphragms in said module to extend parallel to one another, said means for holding including a pressure stable encapsulated holder having a pressure tight connection with said capillary diaphragms at one end and including an outlet in communication with the interior of each of the capillary diaphragms, said module having an inlet for the crude solution and an outlet for the crude solution being arranged on the module with the flow of the crude solution being a turbulent flow parallel to and along the outside of each of the porous glass capillary diaphragms with the permeate passing from the exterior to the interior of each of the capillary diaphragms and to the outlet in communication therewith; and means for creating a flow pressure gradient on the crude material being supplied to the module.

4,411,782

MECHANICAL MEANS FOR SECURING A SCREEN HOLDING CAULKING IN A GROOVE AND METHODS

David L. Auld, Port Neches, and Herbert W. Miller, Beaumont, both of Tex., assignors to Texaco Inc., White Plains, N.Y.

Division of Ser. No. 106,785, Dec. 26, 1979, Pat. No. 4,307,503. This application Sep. 21, 1981, Ser. No. 303,736

Int. Cl.³ B01D *25/00*

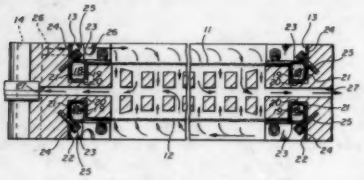
U.S. Cl. 210—230 **6 Claims**

1. Mechanical means for securing a flexible sheet splined into a peripherally grooved flexible sheet holder, said mechanical means being positioned over said spline about a peripheral edge, said groove having one side substantially longer than the other side thereof, wherein

(a) a flexible sheet holder has a groove formed in the end face thereof for securing a flexible sheet therein,

(b) clip means of a predetermined length having legs angled to each other with one leg in direct contact with the outer surface of the spline,

(c) the other leg of said clip means being positioned against and in direct contact with the longer side of said groove, and



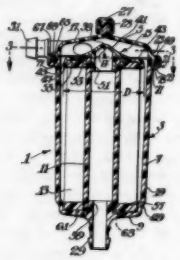
(d) screw means inserted transversely of said groove through said clip means and obliquely to each clip leg for securely fastening said clip means to the longer side of said groove in the end face of said flexible sheet holder for fastening the spline to the flexible sheet holder for resisting environmental conditions of continually changing temperatures to thus increase the service life of said flexible sheet by decreasing flexible sheet maintenance.

4,411,783

ARTERIAL BLOOD FILTER WITH IMPROVED GAS VENTING

Duane D. Dickens, Irvine, and Francis M. Servas, San Juan Capistrano, both of Calif., assignors to Shiley Incorporated, Irvine, Calif.

Filed Dec. 23, 1981, Ser. No. 333,832
Int. Cl.³ B01D *19/00, 27/06, 35/02*
U.S. Cl. 210—304 **13 Claims**



1. A liquid filter suitable for use in an extracorporeal blood flow circuit comprising

a hollow tubular housing having a side wall, a top wall having a highest point at the center thereof and a bottom wall,

a gas vent in said top wall at said highest point,

a perforated tubular core concentrically disposed within said housing,

a cylindrical filter element surrounding said core and displaced from said side wall,

a filter element cap covering the upper ends of said core and said filter element and displaced from said top wall,

a substantially horizontal liquid inlet in said side wall adjacent said top wall, and

a filtrate outlet in said bottom wall of said housing in communication with the space within said core,

with the upper surface of said filter element cap being symmetrical about the longitudinal axis of said housing, having a highest point at its center, and being without any points of localized minimum height, and with said inlet being adapted to direct the incoming flow of liquid in a non-perpendicular manner against the side wall of said housing,

whereby a swirling flow of liquid is established outside said filter element and above said filter element cap.

11. In a hollow tubular housing comprising a plastic upper cup-like portion having a top wall, a downwardly-extending side wall and an open bottom end, secured to a plastic lower cup-like portion having a bottom wall, an upwardly-extending side wall and an open top end, the improvement wherein the lowermost portion of said upper portion includes inner and outer downwardly-extending annular rims defining a first annular groove between them, the uppermost portion of said lower portion includes inner and outer upwardly-extending annular rims defining a second annular groove between them, with said outer annular rim of said lower portion received within said first annular groove so as to leave a gap between said outer annular rim and the base of said first annular groove and with said inner annular rim of said upper portion received within said second annular groove so as to leave a gap between said inner annular rim and the base of said second annular groove, said two outer annular rims are bonded together by ultrasonic bonding and said outer upwardly-extending annular rim is bonded to said inner downwardly-extending annular rim by ultrasonic bonding,

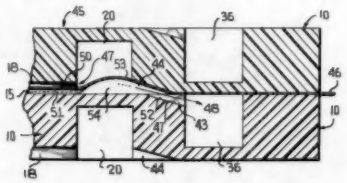
whereby a double shear seal capable of withstanding elevated pressure is obtained.

4,411,784

STACKED PLATE TRANSFER DEVICE

William G. Esmond, 8000 Country Club Rd., Havre de Grace, Md. 21078

Continuation of Ser. No. 596,460, Jul. 16, 1975, abandoned. This application Aug. 10, 1979, Ser. No. 65,727
Int. Cl.³ B01D *13/00*
U.S. Cl. 210—321.1 **18 Claims**



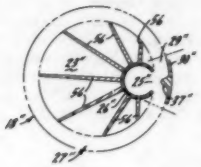
1. A transfer assembly comprising a plurality of generally flat plates arranged in stacked relation, and a membrane extending between each pair of adjacent ones of said plates in sealed relationship with peripheral portions of said plates, each of said plates having a grooved side and a planar side, a central portion of said grooved side having a plurality of adjacent grooves formed therein and defining first flow paths, a central portion of said planar side aligned with said grooved side central portion being planar, a first distribution channel and a first collection channel for a first fluid in said grooved side extending transversely of said grooves at opposite ends of said grooves and in direct communication with said first flow paths, a similar second distribution channel and second collection channel for a second fluid in said planar side in spaced relation to said planar central portion with said membrane being deformable into said grooved side of a next adjacent plate to place said second distribution channel and said second collection channel in communication with said planar central portion across those portions of said planar side between said second distribution channel and said second collection channel and said planar central portion for urging said membrane partially into said grooves to define second flow paths for the second fluid.

4,411,785

REVERSE OSMOSIS HOLLOW FIBER FILTER ELEMENT

Steven P. Yu, Elizabeth; Frank C. Matunas, Point Pleasant, and Nikolaus Zwetkow, Maplewood, all of N.J., assignors to Ecodyne Corporation, Chicago, Ill.

Filed Sep. 29, 1982, Ser. No. 427,864
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—321.1 **6 Claims**



1. A filter element to be vertically supported in a pressure vessel which receives a feedstream of liquid to be treated, comprising:

(a) a vertically extending permeate collection channel means for receipt of a permeate stream thereinto defining an outer surface and a vertically extending length and a longitudinally extending opening formed therein, said permeate collection channel means having a plurality of spaced apart plates defining outer ends remote from said permeate collection channel means and extending radially outwardly from said outer surface of said permeate collection channel and each said plate extending substantially the entire length of said permeate collection channel means;

(b) an annular layer of hollow RO fiber means wound around said outer ends of said plates and said permeate collection channel for separating said feedstream of liquid passing therethrough into a permeate stream and a concentrate stream and for directing said permeate stream into center bores formed by said annular layer of hollow RO fiber means and for directing said concentrate stream within a center core area defined between said plates;

(c) said annular layer of hollow RO fiber means having a section in radial alignment with said opening in said permeate collection channel which is embedded in a bonding material and faced to reveal a plurality of said center bores in communication through said opening with said permeate collection channel for directing said permeate stream from said center bores into said permeate collection channel; and

(d) a permeate collection baffle plate means for closing off the outer surface of the said faced section of said layer of hollow RO fiber means.

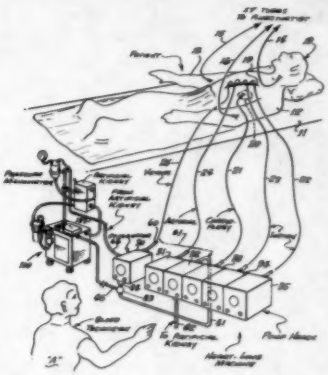
4,411,786

METHOD AND APPARATUS FOR SEPARATING BLOOD FROM OTHER FLUIDS DURING OPERATIVE PROCEDURES

Richard T. Russell, 1180 Akard Dr., Reno, Nev. 89503

Continuation-in-part of Ser. No. 73,189, Sep. 7, 1979, Pat. No. 4,299,705. This application Oct. 5, 1981, Ser. No. 308,102
The portion of the term of this patent subsequent to Nov. 10, 1998, has been disclaimed.
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—321.3 **4 Claims**

1. The combination with a heart-lung machine used in open heart surgery of: blood removal conduit means insertable into a patient at a point adjacent the blood inlet to the heart; means to prime the heartlung machine with fluids other than blood prior to an operation; means to cause blood from a patient to flow from the patient via the blood removal conduit means into the heart lung machine to mix with the priming fluid; means to carry the blood mixed with priming fluid to the oxygenator of the heart lung machine; dual conduit means to remove the blood mixed with priming fluid from the oxygenator and deliver a first portion of the mixture to the patient via a fluid carrying conduit insertable into the patient's body and to deliver a second portion of the mixture to an artificial kidney means; means to cause the said mixture to be treated in an



artificial kidney so as to separate a portion of the priming fluid from the blood; conduit means to remove the blood from which a portion of the priming fluid has been removed from the artificial kidney means and return it into the inlet of the oxygenator; and drain means to remove the priming fluid from the artificial kidney means.

4,411,787

REVERSE OSMOSIS APPARATUS

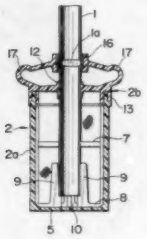
Robert L. Riley, San Diego, Calif., assignor to UOP Inc., Des Plaines, Ill.

Filed Jul. 22, 1982, Ser. No. 400,786
Int. Cl.³ B01D *31/00*
U.S. Cl. 210—321.5 **5 Claims**

1. An apparatus for recovery by reverse osmosis of a desired product from an aqueous solution which comprises a hollow mandrel having axial passageway means provided therein, a layer of first porous backing material adjacent to and surrounding said mandrel, a plurality of generally laterally coextensive leaves of porous backing material in contact with and extending generally radially outward from said first backing material, said leaves having at least one edge thereof in a generally parallel relationship to the longitudinal axis of said mandrel, a plurality of semipermeable membrane sheets each having a fold line therein, said fold line being positioned in contact with said first porous backing material in a generally parallel relationship to the longitudinal axis of said mandrel, and each positioned between two of said leaves of porous backing material, a plurality of separator grid sheets each positioned within the folds of said membranes to form a fluid-conducting passageway within each of said folds, said pluralities of porous backing material, membranes and separator grids being spirally wound around said first backing material in overlapping relationship upon one another to form a roll comprising multiple layers of porous backing material-membrane-fluid-conducting passageways-membranes groupings, means to supply said fluid to one end of said fluid-conducting passageway, means to withdraw fluid from the opposite end of said passageway, and means to withdraw fluid from said hollow mandrel, wherein a backing material for said semipermeable membranes composite consists of a film of a polyethylene terephthalate having a thickness in the range of about 1 mil to about 10 mil and which is positioned between two layers of an epoxy-impregnated

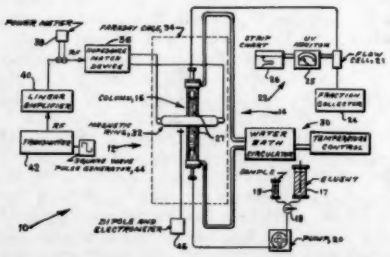
polyester, said composite forming a product-water carrying channel.

4,411,788
FILTER FOR GASOLINE TANK
Shigeru Kimura, Kamakura, Japan, assignor to Nifco Inc., Yokohama, Japan
Filed May 12, 1982, Ser. No. 377,481
Int. Cl.³ B01D *25/00*
U.S. Cl. 210—439 **5 Claims**



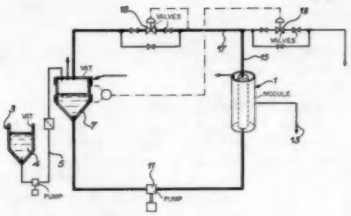
1. In a filter for a gasoline tank, comprising a generally cup shaped filter body having a base and sidewalls containing a net stretched along the periphery thereof and a lid formed to cover the open end of said filter body and provided with an insertion hole for permitting a suction pipe to be inserted into the interior of said filter body and fastened therein, said suction pipe being provided intermediate the length thereof with an engaging portion; said lid further including a retaining member disposed substantially coaxially above said insertion hole and spaced from said lid, and at least a pair of resilient arms integrally attached to said lid and said retaining member for supporting in position said retaining member in spaced relation from said lid, said retaining member being adapted to resin said suction pipe when the free end of said suction pipe is telescoped through said retaining member and said insertion hole until said engaging portion of said suction pipe is moved into fast engagement with said retaining member; and means positioned within said filter body for moveably locating said suction pipe free end.

4,411,789
MAGNETIC RESONANCE CHROMATOGRAPHY
Robert P. Liburdy, 1245 Park Ave., Apt. 16A, New York, N.Y. 10028
Filed Aug. 21, 1981, Ser. No. 295,035
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—635 **6 Claims**



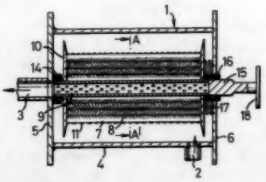
1. In a liquid gel chromatography apparatus having a gel media for partitioning molecules possessing a net positive or negative charge, the improvement therein comprising means operably associated with said chromatography apparatus for generating an oscillating magnetic field which produces eddy currents within said gel media, whereby said eddy currents effect separation patterns for said molecules.

4,411,790
PROCESS FOR THE TREATMENT OF A HYDROCARBON CHARGE BY HIGH TEMPERATURE ULTRAFILTRATION
Jean Arod, Pierrevert; Bernard Bartoli, Jouques; Pierre Bergez, Paris; Jean Biedermann, Montivilliers; Philippe Caminade, Pierrelatte; Jean-Marie Martinet, Montelimar; Jean Maurin, Montivilliers, and Jean Rossarie, Le Havre, all of France, assignors to Commissariat a l'Energie Atomique and Compagnie Francaise de Raffinage, both of Paris, France
Filed May 20, 1981, Ser. No. 265,660
Claims priority, application France, May 22, 1980, 80 11442
Int. Cl.³ B01D *13/00*
U.S. Cl. 210—637 **14 Claims**



1. A process for the treatment of a liquid hydrocarbon charge by ultrafiltration to remove unwanted impurities from said liquid hydrocarbon, said process consisting essentially of circulating said charge at a temperature greater than 100° C. in at least one module comprising at least one mineral ultrafiltration barrier coated with a sensitive layer of mixed oxide of magnesium and aluminum mixed with silica the direction of said circulation being such that said liquid hydrocarbon charge initially contacts an outer surface of said coating whereby said impurities are removed from said liquid hydrocarbon charge by said coated barrier to produce an ultra-filtrate essentially free of impurities, said barrier having a radius of permeametry between 50 Å and 250 Å and being adapted to support a counter pressure of between 1 and 30 relative bars.

4,411,791
SEPARATION EQUIPMENT
Denis S. Ward, Walton-on-Thames, England, assignor to The British Petroleum Company, p.l.c., London, England
Filed Jan. 20, 1982, Ser. No. 341,136
Claims priority, application United Kingdom, Jan. 21, 1981, 8101786
Int. Cl.³ B01D *17/02, 27/12*
U.S. Cl. 210—649 **4 Claims**



1. A cartridge for removing contaminants from a liquid, which cartridge comprises (a) a casing having a central port and a circumferential port, (b) a perforated rigid hollow tube, the interior of which is in communication with the central port, (c) a perforated cylinder, the exterior of which is in communi-

cation with said circumferential port, (d) a roll of liquid permeable material disposed within the perforated cylinder such that any flow of liquid between the ports passes radially through the roll characterized in that

(i) the roll is formed from a resilient sheet having a layer of fibers attached thereto,

(ii) the sheet is attached at its outer end to the perforated cylinder and at its inner end to the perforated tube

(iii) means are provided to rotate the perforated tube, which means are operable to vary the tension of the resilient sheet during use, to compress the fibres into a network of fine channels, and to open up the network into a series of relatively wide channels.

4. A method for treating a mixture of a first immiscible liquid finely dispersed in a second immiscible liquid so as to coalesce the first immiscible liquid comprises passing the mixture radially through a cartridge containing a roll of fibrous coalescing material said cartridge comprising (a) a casing having a central port and a circumferential port, (b) a perforated rotatable rigid hollow tube, the interior of which is in communication with said central port, (c) a perforated cylinder, the exterior of which is in communication with said circumferential port, characterized in that

(i) the fibrous material comprises a mass of fibers held in compression by a coiled liquid permeable resilient sheet supporting said fibers, said sheet being attached at its outer end to the perforated cylinder and at its inner end to the perforated tube to releasably maintain said sheet under tension and compress the fibers into a network of fine channels and

(ii) after a quantity of the mixture has been passed through the fibrous coalescing material, the rotatable member is rotated so as to reduce the tension on the sheet and the compression of the fibers to open up the network into a series of relatively wide channels and the fibers are then washed by passing a washing liquid through the roll of fibrous material.

4,411,792

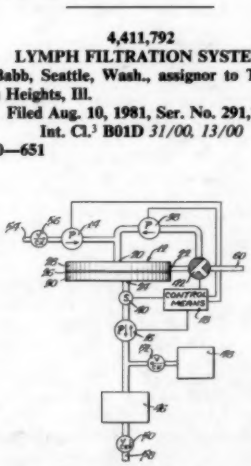
LYMPH FILTRATION SYSTEM

Albert L. Babb, Seattle, Wash., assignor to Trimedyne, Inc., Arlington Heights, Ill.

Filed Aug. 10, 1981, Ser. No. 291,175

Int. Cl.³ B01D *31/00, 13/00*

U.S. Cl. 210—651 **27 Claims**



19. A lymph filtration system for removing lymph from a patient, separating the lymph into a liquid fraction and a cellular component fraction and returning the liquid fraction to the patient, the system comprising:

(a) a filtration cell having an inlet, a cellular component outlet and a filtrate outlet, the filtration cell also having a membrane filter dividing the cell into a filtering chamber and a filtrate chamber, the inlet and cellular components outlet in fluid communication with the filtering chamber and the filtrate outlet in fluid communication with the filtrate chamber, the filtrate chamber defining a spiral flow path between the inlet and the cellular component outlet, the spiral flow path being substantially coplanar with the membrane filter;

(b) an input pump for pumping lymph from the patient to the inlet of the filtration cell;

(c) an inlet check valve between the patient and the pump.

(d) a hydraulic sensing means operably associated with the filtrate outlet;

(e) a reversible filtrate pump in fluid communication with the filtrate outlet for pumping fluid to and from the filtrate chamber, the filtrate pump when in the operating mode to pump liquid from the filtrate chamber to the patient, and when in a backflush mode, to pump fluid into the filtrate chamber to produce a positive transmembrane pressure from the filtrate chamber to the filtering chamber to backflush the membrane filter;

(f) a control means operably associated with the hydraulic sensor for controlling the outlet pumping means;

(g) a recirculation loop in fluid communication between the cellular component outlet and the inlet of the filtration cell, the recirculation loop having a recirculation pump to pump fluid from the outlet to the inlet to increase fluid flow through the filtering chamber;

(h) an outlet check valve between the filtrate pump and the patient;

(i) a backflush fluid source in fluid communication with the filtrate pump between the filtrate pump and the outlet check valve; and

(j) a backflush check valve between the backflush fluid source and the filtrate pump such that when the filtrate pump is in the operating mode, liquid fraction is pumped from the filtrate chamber to the patient and when the filtrate pump is in the backflush mode, backflushing fluid is pumped from the backflush fluid source into the filtrate chamber.

4,411,793

PROCESS FOR THE SEPARATION OF ELEMENTS BY CHROMATOGRAPHY

Michio Kato; Toshiyuki Endo, and Junji Nomura, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 23, 1981, Ser. No. 333,696

Claims priority, application Japan, Dec. 24, 1980, 55-181833; Dec. 27, 1980, 55-185088

Int. Cl.³ B01D *15/08*

U.S. Cl. 210—656 **21 Claims**

1. In a process for the separation of elements selected from the group consisting of Li, Be, Na, Mg, Al, Si, K, Ca, Sc, Ti, V, Cr, Mn, Fe, Co, Ni, Cu, Zn, Ga, Ge, Rb, Sr, Y, Zr, Nb, Mo, Tc, Ru, Rh, Pb, Ag, Cd, In, Sn, Sb, Te, Cs, Ba, lanthanide elements, Hf, Ta, W, Re, Os, Ir, Pt, Au, Hg, Tl, Pb, Bi, Po, Fr, Ra and actinide elements, by chromatography which comprises supplying an original aqueous solution of a mixture of elements to be separated to a column packed with an adsorbent to form an adsorption band of elements on the adsorbent while forming a front zone left in front of the adsorption band and feeding an eluent to the column to develop the adsorption band while forming a rear zone in rear of the adsorption band, the improvement wherein when the length of the front zone becomes

$$\frac{V}{A} \times \frac{R}{1-R} \text{ (cm) or less}$$

wherein V is the void volume of the column which includes the pore volume of the adsorbent packed in the column, cm^3; A is the sectional area of the column, cm^2 and R is the molar fraction of the elements to be separated which is present in the liquid phase of the adsorption band, the adsorption band of elements formed on the adsorbent packed in a column is developed using a main eluent having a relatively high concentration, whereby the adsorption band of elements is developed

without causing the entry of said main eluent into the front zone.

4,411,794

PROCESS FOR THE PURIFICATION OF THE BLOOD CLOTTING FACTORS, II, VII, IX AND/OR X

Horst Schwinn; Norbert Heimburger, both of Marburg; Gerhardt Kumpe, Wetter, and Heinz H. Drescher, Neustadt, all of Fed. Rep. of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg, Fed. Rep. of Germany

Filed Jan. 19, 1982, Ser. No. 340,896

Claims priority, application Fed. Rep. of Germany, Jan. 21, 1981, 3101752

Int. Cl.³ B01D *15/00*

U.S. Cl. 210—670 **6 Claims**

1. A method for purifying a blood clotting factor selected from the group consisting of Factors II, VII, IX, and X, which method comprises adsorbing said blood clotting factor on a mineral adsorbent from a solution containing at least one such blood clotting factor together with calcium ions contributed by a calcium salt dissolved in said solution, and then eluting adsorbed blood clotting factor from said mineral adsorbent with a buffer of high ionic strength.

4,411,795

PARTICLE ADSORPTION

Wayne P. Olson, Valencia, Calif., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Continuation-in-part of Ser. No. 128,617, Mar. 10, 1980, abandoned. This application Feb. 26, 1981, Ser. No. 238,410

Int. Cl.³ B01D *15/00*

U.S. Cl. 210—679 **21 Claims**

1. A method for removing lipin particles from suspension in a fluid, comprising contacting the suspension with an adsorbent composition having the formula

$$[(Y)_eB]_dZ$$

wherein Y is a hydrophobic ligand, B is a strong ionogenic group, Z is a water insoluble carrier, e is an integer and d is greater than 2 under conditions to adsorb the particles, followed by separating the compositions from the fluid.

4,411,796

POLYAMINIC RESIN FOR THE SELECTIVE SEPARATION OF HEPARIN FROM OTHER GLUCOSAMINOGLYCANES AND METHOD FOR THE PREPARATION THEREOF

Benito Casu, Milan; Giangiacomo Torri, Bergamo, and Giorgio Zoppetti, Milan, all of Italy, assignors to Crinos Industria Farmabiologica, S.p.A., Villa Guardia, Italy

Division of Ser. No. 251,874, Apr. 6, 1981, Pat. No. 4,369,256. This application Sep. 29, 1982, Ser. No. 431,732

Claims priority, application Italy, Apr. 18, 1980, 21499 A/80

Int. Cl.³ C13D *3/14*

U.S. Cl. 210—692 **4 Claims**

1. A method for selectively adsorbing a single mucopolysaccharidic compound from a mixture of glucosaminoglycanes in an aqueous solution, wherein said solution is contacted under stirring with a polyalkyleneamine crosslinked by means of a diisocyanate, the crosslinking degree, based on the molar ratio between said diisocyanate regarded as monofunctional and said polyalkyleneamines regarded as monomeric units, ranging from 0.1 to 1.0.

4,411,797

DEWATERING OF SEWAGE SLUDGES ON CHAMBER FILTER PRESSES

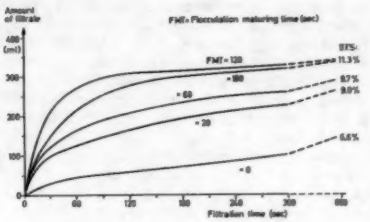
Bruno Sander, Ludwigshafen; Klaus Hess, Bad Duerkheim; Peter Lintz, Heidelberg, and Walter Goesele, Frankenthal, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 149,964, May 15, 1980, abandoned. This application Oct. 2, 1981, Ser. No. 308,129

Claims priority, application Fed. Rep. of Germany, May 19, 1979, 2920350

Int. Cl.³ C02F *1/54, 11/14*

U.S. Cl. 210—727 **6 Claims**



1. A process for dewatering sewage sludges with a chamber filter press without adding lime, ash or sand wherein the flocculated flake structure of the sludge remains stable in the filter press, which comprises:

a. adding an organic flocculant to the sewage sludge in the amount of from 100 to 400 g/m³ of sewage sludge;

b. mixing the organic flocculant with the sewage sludge;

c. holding the flocculant and sludge mixture for from 0.5 to 5 minutes for the formation of flocculated sewage sludge particles;

d. passing the flocculated sewage sludge to a gravity filtration stage without pumping, thereby preventing the break-up of flocculated sewage sludge particles;

e. gravity filtering the flocculated sewage sludge using a gravity filtration means to a sludge solids content of from 10 to 20% by weight;

f. passing the gravity filtered flocculated sewage sludge particles to a chamber filter press without using shear forces by conveying using reciprocating diaphragm pumps or eccentric screw pumps, thereby preventing the break-up of the flocculated sewage sludge particles; and then

g. pressure filtering the gravity filtered flocculated sewage sludge at a pressure of about 10 to 15 bar using a chamber filter press to a sludge layer thickness of from 15 to 30 mm, the sludge layer thickness being selected to suit the particular sludge to achieve a particularly high dewatered sludge solids content.

3. A process as claimed in claim 1, wherein the sewage sludge is mixed homogeneously with coal sludge, sewage sludge ash, or a combination thereof before being flocculated and subjected to the two-stage dewatering treatment.

4,411,798

PROCESS FOR SEPARATING D_2O FROM H_2O USING SURFACTANT SYSTEMS

Keng S. Chan, South Euclid, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Continuation of Ser. No. 153,490, May 27, 1980, abandoned. This application Oct. 9, 1981, Ser. No. 309,948

Int. Cl.³ B01D *21/01*

U.S. Cl. 210—727 **9 Claims**

1. A process for separating D_2O from solutions of D_2O in H_2O, the process comprising:

(i) adding an anionic surfactant system to a solution of D_2O

in H_2O in an amount capable of forming micelles of the surfactant;

(ii) providing a separating agent in the solution in an amount sufficient to form a flocculated micellar first phase containing a majority of the surfactant system with an increased concentration of D_2O and a second phase containing excess water with a decreased concentration of D_2O;

(iii) separating the first phase from the second phase;

(iv) introducing an additional solution of D_2O in H_2O to the first phase; and

(v) repeating steps (i)-(iii) to separate said D_2O from said additional solution.

4,411,799

METHOD FOR STABILIZING AN AQUEOUS SOLUTION CONTAINING A CHLORINE-BASED OXIDANT

Tomohisa Ito, Funabashi, and Akira Hongo, Machida, both of Japan, assignors to Nitto Chemical Industry Co., Ltd., Tokyo, Japan

Filed Jan. 19, 1982, Ser. No. 340,595
Claims priority, application Japan, Jan. 19, 1981, 56/5063
Int. Cl.³ C02F *5/08, 1/76*
U.S. Cl. 210—753 **10 Claims**

1. A method for stabilizing an aqueous solution containing a chlorine-based oxidant comprising both glycine and at least one halide in a weight ratio of 1:9 to 9:1 with the halide selected from bromide and iodide in the solution.

4,411,800

HIGH TEMPERATURE STABLE FLUID LOSS CONTROL SYSTEM

Peter C. Green, Ellicott City, and Jacob Block, Rockville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Apr. 24, 1981, Ser. No. 257,091
Int. Cl.³ C09K *7/02*
U.S. Cl. 252—8.5 A **7 Claims**

1. A composition capable of imparting fluid loss control to aqueous systems comprising a mixture of:

(a) a substantially water insoluble, solid, particulate silicate or alumino-silicate material which contains a major amount of kaolinite, halloysite, montmorillonite or illite or mixtures thereof, or attapulgite or sepiolite and being of a particle size such that at least about 90 percent by weight is capable of passing through a No. 20 U.S. Standard Sieve; in combination with

(b) a chemical compound capable of converting to a higher oxidation state under alkaline conditions selected from the group consisting of C_1–C_5 alkanols, unsubstituted or C_1–C_3 alkyl, aryl or alkaryl substituted phenols, hydroquinone, tert-butyl catechol catechol, C_1–C_{15} alkanethiol, alkali metal, alkaline earth metal or ammonium salt of sulfite, bisulfite and nitrite, ferrous metal salts of chloride and sulfate and cuprous metal salts of chloride and sulfate; in combination with

(c) a reaction product formed between a polymeric material having a weight average molecular weight of at least about 20,000 selected from the group consisting of polyvinyl alcohol and hydroxy C_1–C_3 alkyl cellulose and at least from about 1 to 200 percent of stoichiometry of a crosslinking agent selected from the group consisting of a compound containing at least one aldehyde group therein or a compound capable of generating in situ at least one aldehyde or an epihalohydrin; the reaction between said polymeric material and said aldehyde carried out in an aqueous acidic medium having a pH of 5.5 or less and the reaction between said polymer and said epihalohydrin being carried out in an aqueous basic medium having a pH of at least about 9.5;

wherein the weight ratio of component (a) to (c) is at least from about 0.75:1 to 3:1 and of component (b) to (c) is at least from about 0.2:1 to 1:1.

4,411,801

LOW SOLIDS WELL SERVICING FLUIDS

Daniel G. Pomerleau, Calgary; Douglas E. Slocombe, Millarville, and Kenneth H. Watts, Calgary, all of Canada, assignors to NL Industries, Inc., New York, N.Y.

Filed Sep. 17, 1981, Ser. No. 303,154
Int. Cl.³ C09K *7/02*
U.S. Cl. 252—8.5 P **17 Claims**

1. An emuslifying composition comprised of a mixture of approximately equal amounts of (a) polyoxyethylene glycol 500 monotallate, (b) nonyl phenol ethoxylate containing approximately 43% by weight of oxyethylene groups and (c) nonyl phenol ethoxylate containing approximately 65% by weight of oxyethylene groups, for use in preparing low solids drilling fluids.

2. A low solids oil-in-water emulsion well servicing fluid, substantially free of added clay-type viscosifying agents, comprising an aqueous medium, at least 5% by volume of a liquid hydrocarbon coating agent and an emulsifying amount of the emulsifying composition of claim 1.

4,411,802

ENHANCED OIL RECOVERY

George W. Lester, Hoffman Estates, and Thomas P. Malloy, Lake Zurich, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Sep. 8, 1981, Ser. No. 299,708
Int. Cl.³ E21B *43/22*
U.S. Cl. 252—8.55 D **9 Claims**

1. A process for enhanced oil recovery from a subterranean reservoir of oil by injecting into said reservoir an aqueous surfactant slug to enhance displacement of said oil from said reservoir, said aqueous surfactant slug comprising from about 1 to about 10 weight percent of a neutralized sulfonate of powdered coal prepared by:

(a) grinding a coal source to a particle size in the range of from about 5 to about 200 Tyler standard mesh;

(b) treating said ground coal of step (a) with a sulfonating agent selected from the group consisting of sulfur trioxide and sulfuricacid at a temperature in the range of from about ambient to about 50° C. to produce a sulfonated powdered coal;

(c) neutralizing said sulfonated powdered coal by adding an alkaline component at a temperature in the range of from about 50° C. to about 75° C. for a period of time to raise the pH of said sulfonated powdered coal to in excess of 7 to produce a neutralized sulfonated powdered coal;

(d) recovering said neutralized sulfonated powdered coal for injection to said subterranean reservoir in oil.

4,411,803

DETERGENT SOFTENER COMPOSITIONS

Harold E. Wixon, New Brunswick, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 201,168, Oct. 27, 1980, Pat. No. 4,329,237, which is a continuation-in-part of Ser. No. 96,370, Nov. 21, 1979, Pat. No. 4,298,480, which is a continuation-in-part of Ser. No. 968,532, Dec. 11, 1978, Pat. No. 4,230,590. This application Mar. 22, 1982, Ser. No. 360,642
The portion of the term of this patent subsequent to May 11, 1999, has been disclaimed.
Int. Cl.³ C11D *1/86, 10/04, 17/06*; D06M *13/48*
U.S. Cl. 252—8.75 **5 Claims**

1. A detergent softener composition capable of imparting improved softness, detergency, antistatic and soil antiredeposition properties to fabrics treated therewith in the wash cycle of a laundering process comprising a particulate detergent base containing from about 5–40% by weight relative to the composition of a water soluble non-soap organic surfactant, at least about 90% thereof being of the anionic type, and from about 10–60% by weight relative to the composition of a water soluble, neutral to alkaline builder salt selected from the group

consisting of sodium tripolyphosphate, sodium silicate, sodium carbonate and sodium bicarbonate or mixtures thereof; said detergent base being (I) in admixture with discrete particles of cationic amine softener, said softener being selected from the group consisting of (a) aliphatic di-(lower) C_1–C_4 alkyl, di(-higher) C_{14}–C_{24} alkyl quaternary ammonium salts (b) heterocyclic compounds, and mixtures of (a) and (b), and (II) in admixture with discrete particles of from about 2–20% by weight of the composition a mixture of water soluble or dispersable fatty acid soap and nonionic organic surfactant, the weight ratios of soap to softener being from about 8:1 to 1:3, the percent concentration of anionic surfactant being at least about 1.5x+5, wherein x represents the percent concentration of softener, said softener particles comprising from about 2 to 20% by weight of the composition and being free of the soap-nonionic mixture, said soap-nonionic mixture particles being free of the cationic softener, and said detergent base being free of cationic softener.

4,411,804
SOLID PARTICLES CONTAINING LUBRICATING OIL COMPOSITION

Donald L. DeVries, South Holland, and James M. DeJovine, Homewood, both of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Continuation-in-part of Ser. No. 752,225, Dec. 20, 1976, Pat. No. 4,094,799, Ser. No. 893,098, Apr. 3, 1978, Pat. No. 4,134,844, Ser. No. 893,100, Apr. 3, 1978, Pat. No. 4,132,656, and Ser. No. 893,101, Apr. 3, 1978, Pat. No. 4,136,040. This application Jun. 6, 1978, Ser. No. 913,183

The portion of the term of this patent subsequent to Jun. 13, 1995, has been disclaimed.

Int. Cl.³ C10M *1/12*

U.S. Cl. 252—29 **3 Claims**

1. A lubricating oil composition of matter comprising: a major amount by weight of oil of lubricating viscosity; from about 0.1% to about 2% by weight of the total composition of solid particles effective to improve the lubricating properties of said composition; and from about 3% to about 10% by weight of the total composition of at least one dispersant-VI improver compound which acts to improve the dispersant properties of said lubricating oil composition and also acts to improve the viscosity index of said lubricating oil composition, said solid particles being selected from the group consisting of graphite, molybdenum disulfide, zinc oxide, and mixtures thereof, said composition of matter characterized by its ability to reduce friction in an internal combustion engine without exhibiting unacceptable deposit forming tendencies.

4,411,805
N,N',N''-TRISUBSTITUTED-BIS-(P-AMINOBENZYL) ANILINES AS ANTIOXIDANTS

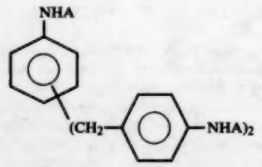
John T. Roberts, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Jan. 8, 1982, Ser. No. 338,444

Int. Cl.³ C10M *1/38*

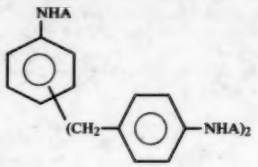
U.S. Cl. 252—47 **21 Claims**

1. A method of inhibiting oxidation in lubricating oils and greases comprising adding to said products an amount effective to inhibit oxidation of a bis-(p-aminobenzyl)aniline with the structure



where A is selected from the group consisting of arylmethyl or heteroarylmethyl moieties of the formula —CH_2X, where X is a monovalent radical whose parent is an aromatic or heteroaromatic ring.

12. A composition comprising a major amount of a lubricating oil or grease and a minor amount sufficient to inhibit oxidation of a bis-(p-aminobenzyl)aniline with the structure



where A is selected from the group consisting of arylmethyl or heteroarylmethyl moieties of the formula —CH_2X, where X is a monovalent radical whose parent is an aromatic or heteroaromatic ring.

4,411,806
ANTIFOAM ADDITIVES

Robert Tirtiaux, and Alain L. P. Lenack, both of Mont Saint Aignan, France, assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Mar. 13, 1981, Ser. No. 243,594

Claims priority, application United Kingdom, Mar. 26, 1980, 8010189

Int. Cl.³ C10M *1/22*

U.S. Cl. 252—49.6 **7 Claims**

1. An improved silicone antifoam composition for lubricating oils which comprises a solution of about 1 to 10% by weight of polydimethylsiloxane of the formula $(CH_3)_3Si(SiO(CH_3)_2)_nOSi(CH_3)_3$ wherein n is an integer to provide a viscosity of about 1,000 to 60,000 cSt at 25° C. in an alkylaromatic hydrocarbon solvent, said solvent being a mono- or polyalkylated benzene having a molecular weight of about 220 to 330; a Cleveland Open Cup flash point of about 140° C. to about 180° C., and boiling between about 290° to about 330° C., said composition exhibiting improved solubility in a lubricating oil composition.

4,411,807
DRY PROCESS FOR THE PRODUCTION OF HEXAGONAL-SYSTEM FERRITE

Yasuo Watanabe; Seiji Isoyama, and Masahiko Bannou, all of Okayama, Japan, assignors to Dowa Mining Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 152,428, May 22, 1980, abandoned. This application Jun. 11, 1982, Ser. No. 387,654

Claims priority, application Japan, Jun. 8, 1979, 54-72098

Int. Cl.³ C04B *35/26*

U.S. Cl. 252—62.58 **10 Claims**

1. A dry process for the production of hexagonal-system ferrite having the generic formula:

$$M.nFe_2O_3$$

wherein n represents a number in the range of 5.1–5.8 inclusive; and M represents at least one metallic element selected from the group consisting of Ba, Sr and Pb, said process consisting essentially of the steps of:

(a) forming a mixed additive of X-agent and Y-agent, wherein said X-agent is at least one chloride of alkaline metal selected from the group consisting of KCl, NACl and LiCl, and said Y-agent is at least one metaborate of alkali metal selected from the group consisting of KBO_2, $NaBO_2$, and $LiBO_2$ or at least one carbonate of alkali metal selected from the group consisting of K_2CO_3, Na_2CO_3 and Li_2CO_3 or a mixture of at least one of said metab-

orate and at least one of said carbonate, the ratio of X-agent to Y-agent depending on the desired axial ratio of A-axis to C-axis of the intended ferrite and being 1:02—about 1;

(b) adding the mixed additive of said X- and Y-agents prepared according to said predetermined ratio to a ferrite-forming unbaked raw material composition comprising an iron oxide powder and a metal compound powder, said metal being at least one of Ba, Sr and Pb, in a manner such that the total amount of said mixed additive comprised 5–20% by weight of the final ferrite product;

(c) baking within a temperature range of 900°–1300° C. the mixture of said mixed additive and unbaked raw material composition so as to form a ferrite; and

removing substantially all of said mixed additive from the resulting ferrite by treating it with wet-process disintegration, which consists of disintegrating the ferrite in water and dewatering the disintegrating ferrite, or, alternatively, with dry-process disintegration and washing with water followed by drying.

4,411,808

MULTIFUNCTIONAL ADDITIVE FOR POWER TRANSMISSION SHIFT FLUIDS

Antonio Gutierrez, Mercerville; Stanley J. Brois, Westfield; Jack Ryer, East Brunswick, and Harold E. Deen, Cranford, all of N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Aug. 4, 1982, Ser. No. 405,297
Int. Cl.³ C10M *1/00, 3/32*
U.S. Cl. 252—78.1 **7 Claims**

1. A power shift transmission fluid composition comprising a major amount of a hydrocarbon mineral oil of lubricating viscosity containing an oil soluble additive in an amount effective to provide oxidation inhibition, copper and brass corrosion inhibition and friction modification to said fluid, said additive being an ester formed by esterifying equimolar proportions of a straight chain C_1–C_{30} alkenyl, alkyl, thioalkyl or thioalkenyl succinic acid or anhydride with an ethoxylated or propoxylated alkyl mercaptan having 8 to 20 carbon atoms and containing 1–6 moles of ethylene oxide or propylene oxide per mole of said alkyl mercaptan.

4,411,809

CONCENTRATED HEAVY DUTY PARTICULATE LAUNDRY DETERGENT

Harold E. Wixon, New Brunswick, N.J., assignor to Colgate Palmolive Company, New York, N.Y.

Division of Ser. No. 746,900, Dec. 2, 1976, Pat. No. 4,248,911. This application Sep. 2, 1980, Ser. No. 183,022
Int. Cl.³ C11D *3/075, 3/12, 11/00, 17/06*
U.S. Cl. 252—91 **5 Claims**

1. A free flowing particulate heavy duty laundry detergent of bulk density of at least 0.6 g/cc. and particle sizes in the range of 4 to 140 mesh which comprises substantially globular sodium tripolyphosphate particles, zeolite particles and nonionic detergent,

with the tripolyphosphate particles being of sizes in the 8 to 140 mesh range, U.S. Standard Sieve Series and containing about 5–15% water and about 10–20% of sodium silicate having an Na_2O:SiO_2 ratio in the range of about 1:1.6 to about 3.0,

wherein said nonionic detergent is in the interior and coats the surfaces of the tripolyphosphate particles, said nonionic detergent coat adhering zeolite particles to the tripolyphosphate particles so as to produce a first layer of non-ionic detergent and zeolite particles;

and wherein said nonionic detergent is also present as a second coating on the surface of said first layer and zeolite particles are also adhered to said second nonionic detergent coating to render said product free flowing;

the zeolite particles of the first and second layers being of ultimate particle diameters in the range of 0.01 to 20 microns, said zeolite being a crystalline, amorphous or mixed crystalline and amorphous zeolite, the exchange rate and capacity of said zeolite being such that when about 375 ppm of said zeolite on an anhydrous basis is placed in water at about 45° C. containing about 40 ppm of dissolved calcium ion while vigorously stirring the dissolved calcium ion content is reduced to below about 8 ppm in about 5 minutes,

and said nonionic, detergent being a higher fatty alcohol polyethylene oxide condensate wherein the higher fatty alcohol is of about 10 to 18 carbons and the polyethylene oxide is of about 3 to 15 moles of ethylene oxide per mole of higher fatty alcohol.

4,411,810

LOW-FOAMING NONIONIC SURFACTANT FOR MACHINE DISHWASHING DETERGENT

Daniel R. Dutton, Grosse Ile; Edward J. Parker, Trenton; Roger A. Ott, New Boston, and Jay G. Otten, Flat Rock, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 6, 1981, Ser. No. 318,751
Int. Cl.³ C11D *7/18*
U.S. Cl. 252—99 **12 Claims**

1. A low-foaming alkaline machine dishwashing detergent composition devoid of alkyl phosphate ester consisting essentially of:

A. about 1 to about 10 percent by weight of a nonionic surfactant consisting essentially of

(1) a nonionic surfactant characterized as a block or heteric/block polyoxyalkylene having a cloud point in a 1 weight percent aqueous solution of about 15° C. to about 25° C. selected from the group consisting of at least one of the polyoxyalkylenes having the formulas:

$$Y[(EO/A)_m(A)_nH]_x \quad \text{I}$$

$$Y[(A)_o(EO)_m(A)_nH]_x \quad \text{II}$$

$$Y[(A)_o(EO/A)_m(A)_nH]_x \quad \text{III}$$

$$Y[(EO/A)_m(EO/A)_nH]_x \quad \text{IV}$$

wherein EO represents ethylene oxide which is present in the polymer in the proportion of about 5 to about 60 percent by weight; Y represents the nucleus of an active hydrogen-containing organic compound having a functionality of x and (1) about 2 to about 6 carbon atoms and 2 to 3 reactive hydrogen atoms or (2) about 6 to about 18 carbon atoms and 1 to 3 reactive hydrogen atoms; A represents a lower alkylene oxide selected from the group consisting of propylene oxide, butylene oxide, tetrahydrofuran or mixtures thereof wherein up to 25 percent by weight of A is reacted directly with said oganic compound either alone in formulas II and III or in admixture with ethylene oxide in formulas I and IV and 75 percent by weight or more of A is subsequently reacted to produce said polymer; m, n and o are integers individually selected such that the average total molecular weight of the polymer is about 2500 to about 10,000 or

(2) a nonionic surfactant characterized as a block polyoxyalkylene having a cloud point of about 18° C. to about 22° C. selected from the group consisting of at least one of the polyoxyalkylenes having the formula:

$$Y[(EO)_m(A)_nH]_x \quad \text{V}$$

wherein Y, EO, A, m, n, x, molecular weight and useful proportions are as defined above;

B. about 20 to about 80 percent by weight of an alkaline detergent builder salt selected from at least one of the group consisting of sodium carbonate, sodium bicarbonate, disodium orthophosphate, trisodium orthophosphate, sodium metasilicate, sodum sesquisilicate, sodium borate,

sodium tetraborate, sodium aluminum silicate, and sodium bisulfate;

C. about 20 to about 80 percent by weight of (1) a water-soluble metallic salt of citric acid or an organic sequestering agent selected from the group consisting of at least one of tetrasodium ethylene diamine tetraacetate and nitrilotriacetic acid or (2) alternatively, an alkaline condensed phosphate salt selected from the group consisting of at least one of tetrasodium pyrophosphate and those polyphosphates of the calcium and magnesium ion sequestering type having Na_2O/P_2O_5 weight ratios ranging from 1:1 to 1.67:1 or alternatively (3) mixtures of (1) and (2); and

D. about 5 to about 50 percent by weight of a compound containing active chlorine or available oxygen.

4,411,811

CLARIFICATION OF BLACK PHOSPHORIC ACID WITH PHOSPHORIC ACID RINSE WATER

Mark D. LaVanture, and George L. Walker, both of Richmond, Va., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 288,611, Jul. 30, 1981, Pat. No. 4,377,561, which is a continuation-in-part of Ser. No. 177,037, Aug. 11, 1980, abandoned. This application Sep. 22, 1982, Ser. No. 421,593

Int. Cl.³ C01B *25/16*; C05B *11/00*

U.S. Cl. 252—182 **6 Claims**

1. A clarified phosphoric acid composition comprising a mixture of black wet process phosphoric acid with phosphoric acid rinse water in a weight ratio of rinse water black phosphoric acid between about 0.5 and about 5, said phosphoric acid rinse water being the water collected from aluminum bright dipping water rinsing and containing, by weight, about 10–45% P_2O_5 and impurities including about 0.5–3% HNO_3 and about 0.2–3% Al.

4,411,812

DICHROIC LIQUID CRYSTAL COMPOSITIONS MADE WITH ASYMMETRIC TRIS-AZO DYES

Siegfried Aftergut, Schenectady, and Herbert S. Cole, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Nov. 12, 1981, Ser. No. 320,281

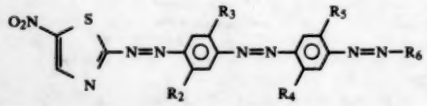
Int. Cl.³ G02F *1/13*; C09K *3/34*

U.S. Cl. 252—299.1 **7 Claims**

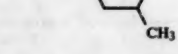
1. A liquid crystal composition for use in a liquid crystal display, comprising:

a host liquid crystal material; and

a guest tris-azo dichroic dye dissolved in said host liquid crystal material, said dichroic dye having a 5-nitrothiazolyl terminal group and the general formula,



wherein R_2, R_3, R_4 and R_5, are selected from the group consisting of hydrogen, alkyl halogen and alkoxy, and R_6 is selected from the group consisting of



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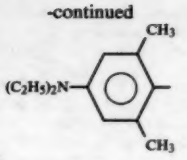
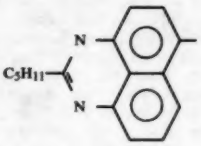
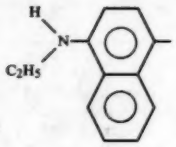
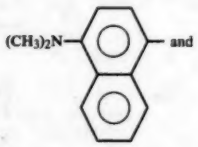
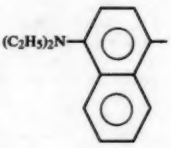








and



4,411,813

PROCESS FOR EMULSIFYING AND STABILIZING ANISE ESSENCES, ANETHOLE AND ESSENTIAL OILS OR FATS IN THE AQUEOUS PHASE

Max Voisin, 23, Rue Fourcroy, 75017 Paris, France

Filed May 28, 1981, Ser. No. 268,023

Claims priority, application Luxembourg, May 30, 1980, 82495

Int. Cl.³ B01J *13/00*

U.S. Cl. 252—312 **15 Claims**

1. Stable essential oil emulsions, characterized in that they contain at least:

50 to 100 parts of essential oils,

0.5 to 10 parts at least of an emulsifying agent and water.

4,411,814

USE OF POLYAMINES AS DEMULSIFIERS

Charles W. Burkhardt, Florissant, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

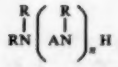
Continuation-in-part of Ser. No. 836,123, Sep. 23, 1977, abandoned, which is a continuation-in-part of Ser. No. 814,514, Jul. 11, 1977, abandoned. This application Feb. 10, 1981, Ser. No. 233,272

Int. Cl.³ B01D *17/04*

U.S. Cl. 252—344 **15 Claims**

1. A process for the resolving of emulsions and the destabili-

zation of entrapped water in the form of micells or solubilized by petroleum sulfonates during the tertiary recovery of crude oil by sulfonate floods, said emulsion containing a petroleum sulfonate, a mobility control agent and a viscosity treating agent which comprises treating said emulsion with 160 ppm to 600 ppm of a polyamine, a polyamine salt or a polyamine and a polyamine salt at a pH of below about 7, said polyamines having the general formula



where R is hydrogen, alkyl, alkanol or alkanol ether and A is alkylene having from 2 to 10 carbon atoms, where n is greater than 1 and up to 19 and have a molecular weight of 60 to 600, said polyamines being water soluble or water dispersible and having a hydrophilic portion sufficiently large to couple with the oil soluble petroleum sulfonate to form a salt.

4,411,815
PROCESS FOR PREPARING ODORLESS ALKYL ETHER SULFATE CONCENTRATES

Hideo Ando, Tokyo; Akira Hayashi, Yachiyo, and Kyozo Kitano, Narashino, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jun. 24, 1981, Ser. No. 276,734
Claims priority, application Japan, Jul. 4, 1980, 55-90730
Int. Cl.³ B01F *17/02*
U.S. Cl. 252—353 **8 Claims**

1. A process for deodorizing a polyoxyethylene alkyl ether sulfate aqueous concentrate, said aqueous concentrate containing from 60 to 80 wt.% of polyoxyethylene alkyl ether sulfate having the formula $RO(CH_2CH_2O)_nSO_3M$, wherein R is alkyl having 8 to 18 carbon atoms, n is a number from 2 to 10 and M is a cation providing a water-soluble salt, the balance of said aqueous concentrate consisting essentially of water and the odorous components of unreacted alcohol and cyclic ether by-produced in the sulfation reaction for forming said polyoxyethylene alkyl ether sulfate, said process consisting essentially of the step of: subjecting said aqueous concentrate to a pressure in the range of from 50 to 400 mmHg, at a temperature of from 50° to 130° C., effective to evaporate said odorous components (and some of the water) from said aqueous concentrate, the treatment being carried out for a short period of time effective to prevent hydrolysis and coloration of said polyoxyethylene alkyl ether sulfate.

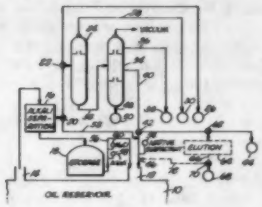
4,411,816
NATIVE PETROLEUM SURFACTANTS

Teh F. Yen, Altadena, and Paul A. Farmanian, Glendale, both of Calif., assignors to The University of Southern California, Los Angeles, Calif.

Division of Ser. No. 958,291, Nov. 6, 1978, Pat. No. 4,232,738. This application Apr. 21, 1980, Ser. No. 141,760
Int. Cl.³ B01F *17/00, 17/16, 17/38*
U.S. Cl. 252—356 **10 Claims**

1. A method for preparing a surfactant, comprising:
providing petroleum of the type having an interfacial tension with water of less than 30 dynes/cm. at high pH;
subjecting said petroleum to fractionation by distillation including distillation under conditions equivalent to vacuum of about 1 Torr in the temperature range of 100°–200° C.;
recovering and combining substantially all of the distillate in said temperature range, separated from lower boiling distillate, to obtain said surfactant; and
adding said surfactant to petroleum.

4. A mixture formed of (a) a composition comprising a combined fraction distilled under conditions equivalent to vacuum at about 1 Torr in the temperature range of 100°–200° C., separated from lower boiling distillate, from, and (b), whereby



there is at least one part of said composition mixed with 10^4 parts of petroleum.

4,411,817
PRODUCTION OF SYNTHESIS GAS

James F. Elliott, Los Angeles; George N. Richter, San Marino, and Lawrence E. Estabrook, Long Beach, all of Calif., assignors to Texaco Inc., White Plains, N.Y.

Continuation of Ser. No. 117,896, Feb. 1, 1980, abandoned. This application Sep. 11, 1981, Ser. No. 301,348
Int. Cl.³ C10J *3/46*
U.S. Cl. 252—373 **11 Claims**

1. In a process for the production of synthesis gas from an ash-containing carbonaceous fuel wherein said fuel in finely divided form is subjected to partial oxidation in a gasification zone at super atmospheric pressure to produce a product comprising the gases, hydrogen and carbon monoxide, and particles of ash and unconverted fuel, and wherein said particles of ash and unconverted fuel are directed into water contained in a settling zone and in a lock hopper having a narrow valved connecting passageway therebetween, said lock hopper being located below said settling zone, and wherein said ash and unconverted fuel during settling tends to form a bridge above the valve in the connecting passageway to block the passageway and prevent the settling of said particles of ash and unconverted fuel into said lock hopper, the improved method of preventing the formation of a bridge or breaking up a bridge if one has formed which comprises introducing a gas from an external source upwardly into said connecting passageway and said settling zone at a pressure higher than that in the settling zone in order to effectively agitate the water contained therein and prevent the formation of or break up a bridge of ash and unconverted fuel particles.

4,411,818
REACTIVATION OF VANADIUM-CONTAINING OXIDATION CATALYSTS

Peter Reuter, Ludwigshafen; Kurt Blechschmitt, Schifferstadt, and Friedrich Wirth, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Feb. 12, 1982, Ser. No. 348,198
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1981, 3108101
Int. Cl.³ B01J *23/92, 21/20, 27/28*; C07D *307/89*
U.S. Cl. 502—35 **4 Claims**

1. A process for reactivating a supported catalyst used for the preparation of phthalic anhydride by the oxidation of o-xylene or naphthalene, said catalyst including an inert carrier and active material applied to the carrier, said active material consisting essentially of from 1 to 30% by weight of vanadium pentoxide, from 70 to 99% by weight of titanium dioxide and up to 5% by weight of oxides of rubidium, cesium, phosphorus or antimony, which process comprises: treating the catalyst in a first stage at from 100° to 600° C. with a phosphorus compound that is volatile at the reactivation temperature in the

presence of an oxygen-containing gas, said phosphorus compound being a phosphine, phosphine oxide, hydrogen phosphide, phosphorus oxide, phosphate, phosphite, phosphorus halide, phosphorus oxyhalide or phosphorus sulfohalide; and thereafter treating the catalyst at from 50° to 600° C. with sulfur trioxide or a mixture of an oxygen-containing gas and at least one of sulfur dioxide, hydrogen sulfide, a mercaptan, carbon disulfide, sulfur, a sulfur halide or a sulfur oxyhalide, said sulfur compound being volatile at the reactivating temperature.

2. The process of claim 1, wherein triphenylphosphine is used as the volatile phosphorus compound.

4. The process of claim 1, wherein, in the preparation of phthalic anhydride by the oxidation of o-xylene over said vanadium-containing catalyst at from 300° to 500° C., the volatile phosphorus compound is passed, together with the o-xylene and the oxygen-containing gas, over the catalyst.

4,411,819
THICKENING AQUEOUS COMPOSITIONS WITH POLYETHERS MODIFIED WITH ALPHA-OLEFIN OXIDES

Edward J. Panek, Trenton, and Pauls Davis, Gibraltar, both of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Division of Ser. No. 86,840, Oct. 22, 1979, abandoned. This application Nov. 24, 1980, Ser. No. 209,437

The portion of the term of this patent subsequent to Jan. 26, 1999, has been disclaimed.

Int. Cl.³ B01J *13/00*

U.S. Cl. 252—315.1 **23 Claims**

1. A thickened aqueous composition comprising water and the polyether polyol prepared by reacting ethylene oxide and at least one lower alkylene oxide having 3 to 4 carbon atoms with at least one active hydrogen compound containing at least two active hydrogens to prepare a heteric or block copolymer and further reacting said copolymer with at least one aliphatic glycidyl ether having about 12 to about 18 aliphatic carbon atoms and wherein said glycidyl ether is present in the amount of about 1 percent to about 20 percent by weight based upon the total weight of said thickener.

7. The process of thickening aqueous systems comprising the addition of an effective thickening amount of a polyether having a molecular weight of about 1000 to about 75,000 prepared by reacting ethylene oxide and at least one lower alkylene oxide having 3 to 4 carbon atoms with at least one active hydrogen aliphatic compound containing at least two active hydrogens to prepare a heteric or block copolymer and further reacting said copolymer with at least one alpha-olefin oxide having a carbon chain length of about 12 to about 18 aliphatic carbon atoms and wherein said alpha-olefin oxide is present in the amount of about 1 percent to about 20 percent by weight based upon the total weight of said polyether.

4,411,820
CATALYST AND PROCESS FOR PREPARING ORGANIC URETHANES

Wayne R. Pretzer, Gibsonia, and Richard B. Pannell, Allison Park, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Apr. 20, 1981, Ser. No. 255,695

The portion of the term of this patent subsequent to May 18, 1999, has been disclaimed.

Int. Cl.³ B01J *31/28, 31/30*

U.S. Cl. 502—167 **6 Claims**

1. A catalyst system useful in the preparation of organic urethanes from the corresponding organic nitro compounds and organic hydroxy compounds which comprises in combination:

(a) a noble metal compound,

(b) a heteroaromatic nitrogen compound having a ring with,

(1) between five and six members in the ring,

(2) only nitrogen and carbon in the ring,

(3) no more than two nitrogens in the ring,

(4) at least two double bonds in the ring,

wherein the molar ratio of the heteroaromatic nitrogen compound to the noble metal compound lies between about 0.1 to 1 and 20 to 1,

(c) an actinide oxide selected from the group consisting of UO_2, U_2O_5, $U_2O_7{}^{-2}$, U_3O_8 and ThO_2, wherein the weight ratio of the noble metal compound to the actinide oxide lies between about 0.001 to 1 and 50 to 1.

4,411,821
1-OLEFIN POLYMERIZATION CATALYST

Edward G. Howard, Jr., Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 237,459, Feb. 23, 1981, abandoned. This application Feb. 17, 1982, Ser. No. 348,167

Int. Cl.³ C08F *4/64*

U.S. Cl. 502—117 **10 Claims**

1. Improved 1-olefin polymerization catalyst system comprising a reaction product of alumina and an organometallic compound of the formula $(RCH_2)_4M$ wherein M is Ti, Zr or Hf and R is a group which is such that there is no hydrogen atom attached to an atom which is in the β-position to M, the improvement characterized in that the preformed catalyst system is combined with an oxide, hydroxide, or carbonate of magnesium, calcium, strontium, or barium.

4,411,822
INITIATOR SYSTEM FOR RADIATION CURABLE COMPOSITIONS, RADIATION CURABLE COMPOSITIONS CONTAINING SUCH AN INITIATOR SYSTEM, A PROCESS FOR CURING SAID COMPOSITIONS AND PRODUCTS COVERED THEREWITH

Hendrik J. Hageman, Rozendaal; Egenius A. Giezen, Rheden, and Leonardus G. J. Jansen, Zevenaar, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Mar. 23, 1981, Ser. No. 246,423

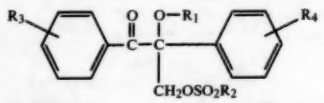
Claims priority, application Netherlands, Mar. 31, 1980, 8001884

Int. Cl.³ B01J *31/02, 31/04*

U.S. Cl. 502—168 **12 Claims**

1. An initiator system for radiation curable compositions said initiator system comprising:

(a) a photoinitiator, with the exception of a compound of the formula:



where R_1 = H or a substituted or unsubstituted alkyl group having 1 to 18 carbon atoms, an alkenyl group having 2 to 18 carbon atoms, a cycloalkyl or cycloalkenyl group having 5 to 8 carbon atoms, a substituted or unsubstituted aryl group having 6 to 20 carbon atoms, a furfuryl group or the group

where Y represents a methyl group and Z an alkyl group having 2 to 4 carbon atoms or Y and Z together form a 1,3- or 1,4- alkylene group having 3 or 4 carbon atoms, which is substituted or not with an alkoxy group having 1 to 4 carbon atoms; R_2 = a substituted or unsubstituted

alkyl group or alkenyl group having 4 to 20 carbon atoms, a cycloalkyl group or cycloalkenyl group having 5 to 8 carbon atoms, an alkaryl group having 4 to 16 carbon atoms in the alkyl group or a furfuryl group; R_3 and R_4 may be the same or different and represent a hydrogen, a chlorine or a bromine atom or a phenyl group, a substituted or unsubstituted alkyl group or alkoxy group having 1 to 4 carbon atoms, or a dialkyl amino group of which the alkyl groups have 1 to 4 carbon atoms and may be substituted or not with a hydroxyl group;

(b) a synergistic amount of a Na, K and/or Li-salt of an organic acid having at least 4 carbon atoms which is compatible with the curable compositions, and

(c) a solvent for component b in such an amount that the solution of salt b in the curable compositions is just about saturated or nearly saturated.

4,411,823

INITIATOR SYSTEM FOR RADIATION CURABLE COMPOSITIONS, RADIATION CURABLE COMPOSITIONS CONTAINING SUCH AN INITIATOR SYSTEM, A PROCESS FOR CURING SAID COMPOSITIONS AND PRODUCTS COVERED THEREWITH

Hendrik J. Hageman, Rozendaal; Willem J. de Klein, Dieren, and Egenius A. Giezen, Rheden, all of Netherlands, assignors to Akzo N.V., Arnhem, Netherlands

Filed Mar. 23, 1981, Ser. No. 246,424

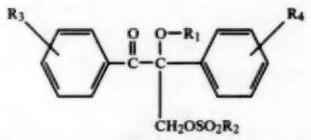
Claims priority, application Netherlands, Mar. 31, 1980, 8001885

Int. Cl.³ B01J *31/02, 31/04*

U.S. Cl. 502—168 **10 Claims**

1. An initiator system for radiation curable compositions, comprising

(a) a compound of the formula:



where R_1 = H or a substituted or unsubstituted alkyl group having 1 to 18 carbon atoms, an alkenyl group having 2 to 18 carbon atoms, a cycloalkyl or cycloalkenyl group having 5 to 8 carbon atoms, a substituted or unsubstituted aryl group having 6 to 20 carbon atoms, a furfuryl group or the group

where Y represents a methyl group and Z an alkyl group having 2 to 4 carbon atoms or Y and Z together form a 1,3- or 1,4-alkylene group having 3 or 4 carbon atoms which is substituted or not with an alkoxy group having 1 to 4 carbon atoms; R_2 = a substituted or unsubstituted alkyl group or alkenyl group having 4 to 20 carbon atoms, a cycloalkyl group or cycloalkenyl group having 5 to 8 carbon atoms, an alkaryl group having 4 to 16 carbon atoms in the alkyl group or a furfuryl group; R_3 and R_4 may be the same or different and represent a hydrogen, a chlorine or a bromine atom or a phenyl group, a substituted or unsubstituted alkyl group or alkoxy group having 1 to 4 carbon atoms, or a dialkyl amino group of which the alkyl groups have 1 to 4 carbon atoms and may be substituted with a hydroxyl group, and

(b) a synergistic amount of a Na, K and/or Li-salt of an organic acid that is compatible with the curable compositions.

4,411,824

METHOD OF MAKING A CATALYST SUITABLE FOR HYDROMETALATION OF HYDROCARBONACEOUS FEEDSTOCKS

H. Chiu Chen, Novato, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Continuation of Ser. No. 262,858, May 12, 1981, abandoned. This application Aug. 11, 1982, Ser. No. 407,207

Int. Cl.³ B01J *21/04, 23/24*

U.S. Cl. 502—323 **12 Claims**

1. A method for making a catalyst for hydroprocessing hydrocarbonaceous feedstocks comprising:

adding peptizing agent to alumina at a temperature of between about 20° to 100° C. to create a slurry having a pH of between 3 and 6;

neutralizing the peptized alumina with aqueous solution of a nitrogen-containing base and a soluble Group VIB transition metal compound to create a shapable plastic mass;

shaping the plastic mass;

drying the mass at 100°–260° C. for between about 1 to 5 hours;

calcining the dried mass at 450°–825° C. for between about 1 to 6 hours.

4,411,825

CURRENT COLLECTOR MANUFACTURING PROCESS FOR AN ELECTROCHEMICAL CELL

Michael Domeniconi, Santa Clara, Calif., assignor to Altus Corporation, San Jose, Calif.

Filed Oct. 5, 1981, Ser. No. 308,258

Int. Cl.³ H01B *1/04*

U.S. Cl. 252—503 **16 Claims**

1. In a method of manufacturing a solid nonconsummable current collector consisting of carbon and a metal for use in an electrochemical cell comprising an oxidizable anode, a liquid cathode and a said current collector; the improvement comprising the steps of:

providing a solution of a salt of said metal;

wetting said carbon with said solution;

removing the solvent from said wetted carbon to form a solid composition of carbon and metal salt; and

exposing said composition of carbon and metal salt to a reducing atmosphere thereby reducing the metal ions of said metal salt to elemental metal.

4,411,826

PREPARATION OF STABLE ELECTRICALLY CONDUCTIVE POLYMERS

Herbert Naarmann, Wattenheim; Klaus Penzien, Frankenthal; Johannes Schlag, and Petr Simak, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Jan. 29, 1982, Ser. No. 344,013

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1981, 3105948

Int. Cl.³ H01B *1/06*

U.S. Cl. 252—518 **3 Claims**

1. A process for the preparation of electrically conductive polymers of improved stability with conductivities greater than 10^{-2} S/cm which comprises:

doping a polyacetylene with from 15 to 66% by weight, based on the polyacetylene, of an electron acceptor dopant to give p-type conductors having conductivities greater than 10^{-2} S/cm, wherein the improvement comprises

heating the p-doped polyacetylene in the absence of oxygen and moisture for from 0.1 to 3 hours at from 500° to 1,100° C.

4,411,827

COPRECIPITATION PROCESS FOR THERMIONIC CATHODE TYPE MATERIALS

David M. Corneille, 311 Granger, Dayton, Ohio 45433

Division of Ser. No. 244,853, Mar. 18, 1981, Pat. No. 4,359,489.
This application Jun. 23, 1982, Ser. No. 391,325
Int. Cl.³ H01B 1/06
U.S. Cl. 252—521 1 Claim

1. A method for producing a homogeneous mixture of uniformly sized, ultrafine, alkaline earth metal carbonates for use as a thermionic emission type coating material which comprises the steps of (1) forming a mixture of alkaline earth metal carbonates composed of about 2 to 10 weight percent calcium carbonate, 10 to 60 weight percent strontium carbonate and the balance barium carbonate; (2) dissolving said mixture in trifluoroethanol to form a solvent mixture; (3) heating said solvent mixture to a temperature of about 60° C. for a period of about five minutes to extract said solvent from said solvent mixture; and (4) recovering the resulting precipitate as a homogeneous, ultrafine mixture of alkaline earth metal carbonates of uniform size and distribution.

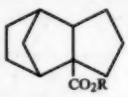
4,411,828

FRAGRANT TRICYCLIC CARBOXYLATES

Yoshiaki Fujikura, Ichikai; Yoshiaki Inamoto; Naotake Takaishi, both of Utsunomiya, and Motoki Nakajima, Miyashiro, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Mar. 3, 1981, Ser. No. 239,896
Claims priority, application Japan, Mar. 14, 1980, 55-32434; Dec. 10, 1980, 55-174247
Int. Cl.³ C07C 69/753; A61K 7/46; C11B 9/00
U.S. Cl. 252—522 R 2 Claims

1. A perfume composition comprising a tricyclo[5.2.1.$0^{2,6}$]-decane-2-carboxylic acid ester of the formula (I):



(I)

wherein R is an alkyl group of 2 or 3 carbon atoms, in an amount sufficient to give a woody note thereto.

4,411,829

PERFUMING INGRENDIENT

Karl H. Schulte-Elte, Onex, and Dietrich Kastner, Givrins, both of Switzerland, assignors to Firmenich SA, Switzerland

Filed Dec. 15, 1981, Ser. No. 331,013
Claims priority, application Switzerland, Jan. 13, 1981, 177/81
Int. Cl.³ A61K 7/46; C11B 9/00
U.S. Cl. 252—522 R 7 Claims

1. A method for modifying, enhancing or improving the odour properties of perfumes or perfumed articles, which comprises adding thereto a small but olfactively effective amount of methyl 2,6,6-trimethyl-cyclohex-2-en-1-yl carboxylate, said compound exhibiting an original fruity-floral odour characterized by nuances of citrus type.

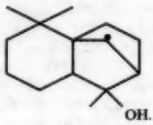
4,411,830

BRIDGED TRICYCLIC ALCOHOL, PROCESS FOR PREPARING SAME AND PERFUMERY USE THEREOF

Kenneth K. Light, North Ogden, Utah; Joseph A. McGhie, Montclair, N.J.; Futoshi Fujioka, Wanamassa, N.J., and Takao Yoshida, West Long Branch, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 287,939, Jul. 29, 1981, Pat. No. 4,373,108, which is a continuation-in-part of Ser. No. 206,649, Nov. 13, 1980. This application Jul. 8, 1982, Ser. No. 396,258
The portion of the term of this patent subsequent to Nov. 2, 1999, has been disclaimed.
Int. Cl.³ A61K 7/46; C11B 9/00
U.S. Cl. 252—522 R 1 Claim

1. A process for augmenting or enhancing the aroma of a perfume composition, cologne or perfumed article comprising the step of adding to a perfume base, a cologne base or a perfumed artilce base an aroma augmenting or enhancing quantity of the compound having the structure:



4,411,831

STABLE LIQUID ANIONIC DETERGENT COMPOSITIONS HAVING SOIL, RELEASE PROPERTIES

Ronald A. Robinson, and John O. Hudson, both of Garden Grove, Calif., assignors to Purex Industries, Inc., Lakewood, Calif.

Filed Dec. 2, 1981, Ser. No. 326,439
Int. Cl.³ C11D 1/83, 3/20
U.S. Cl. 252—554 7 Claims

1. A stable aqueous detergent composition having enhanced soil release properties and consisting essentially of:

(a) 0.2 to 20.0% of an ethylene terephthalate/polyethylene oxide terephthalate copolymer having a ETP/PEOTP ratio of 1:1 to 9:1 and a total molecular weight from about 9,000 and 60,000, the molecular weight of the polyethylene oxide terephthalate being from about 500 to about 6,000;

(b) 5 to 40% of an anionic detergent selected from the group consisting of linear benzene sulfonates having from 10 to 73 carbon atoms, alkane sulfonates having from 14 to 18 carbon atoms, alpha olefine sulfonates having from 14 to 18 carbon atoms, sulfosuccinates, and sulfonated alkyl diphenyloxide;

(c) up to 40% of a nonionic detergent selected from the group consisting of ethoxylated linear alcohols, ethoxylated alkylphenols, ethoxylated mono- and diglycerides and ethoxylated secondary alcohols; and

(d) a buffer sufficient to maintain the pH of the aqueous composition within the range of 5.0 to 9.0.

4,411,832

POLYSACCHARIDE MATRICES COMPRISING MACROMOLECULAR SPACER ARMS FOR USE AS ADSORBENTS IN AFFINITY CHROMATOGRAPHY TECHNIQUES

Pedro Cuatrecasas, 10 Hillside Rd., and Indu Parikh, 4404 Keswick Rd., both of Baltimore, Md. 21210

Continuation of Ser. No. 97,889, Nov. 26, 1979, abandoned, which is a continuation of Ser. No. 6,175, Jan. 24, 1979, abandoned, which is a continuation of Ser. No. 876,126, Feb. 8, 1978, abandoned, which is a continuation of Ser. No. 713,108, Aug. 10, 1976, abandoned, which is a continuation of Ser. No. 475,314, May 31, 1974, abandoned. This application Jul. 27, 1981, Ser. No. 286,763

The portion of the term of this patent subsequent to Sep. 30, 1997, has been disclaimed.

Int. Cl.³ C07G 7/00

U.S. Cl. 260—121 25 Claims

1. In a polysaccharide matrix useful as an adsorbent for affinity chromatography techniques, the improvement which comprises a plurality of polyfunctional, water-soluble macromolecular spacers individually covalently bonded to the backbone of said polysaccharide matrix in direct multipoint covalent attachment thereto, the said polyfunctional macromolecular spacers being selected from the group consisting of (1) poly-L-lysine, (2) the graft copolymer, poly(L-lysyl-DL-alanine), (3) native albumin and (4) denatured albumin and the endstanding functional groups of said polyfunctional macromolecular spacers being essentially sterically unhindered with respect to said polysaccharide matrix.

4,411,833

METHOD FOR PREPARING 26,26,26,27,27,27-HEXAFLUORO-1α,25-DIHYDROXY-CHOLESTEROL

Hector F. DeLuca; Yoko Tanaka, both of Madison, Wis.; Nobuo Ikekawa, Musashinoshi, and Yoshiro Kobayashi, Tokyo, both of Japan, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed May 26, 1982, Ser. No. 382,055

Int. Cl.³ C07J 17/00

U.S. Cl. 260—239.55 R 3 Claims

2. 25,26,27-trinor-1α,2β-epoxy-cholesta-4,6-dien-3-on-24 oic acid methyl ester.

4,411,834

PREPARATION OF 11-DEOXY ANTHRACYCLINE ANTIBIOTICS

Giuseppe Cassinelli, Pavia; Arpad Grein, Milan; Sergio Merli, Milan, and Giovanni Rivola, Milan, all of Italy, assignors to Farmitalia Carlo Erba, S.p.A., Milan, Italy

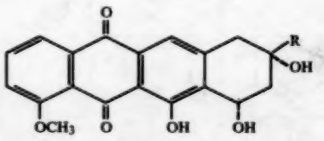
Division of Ser. No. 82,294, Oct. 5, 1979, Pat. No. 4,309,503, which is a division of Ser. No. 9,650, Feb. 5, 1979, Pat. No. 4,247,545. This application Sep. 2, 1981, Ser. No. 298,627

Claims priority, application United Kingdom, Feb. 9, 1978, 5246/78

Int. Cl.³ C07C 49/72, 49/84

U.S. Cl. 260—365 5 Claims

1. An aglycone having the formula:



wherein R is —CO—CH_2OH, —CHOH—CH_3, —CO—CH_3 or —CH_2CH_3.

4,411,835

PREPARATION OF CORTICOIDS FROM 17-KETO STEROIDS

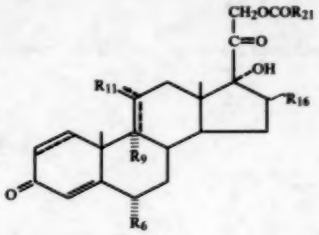
Jerry A. Walker, Oshtemo Township, Kalamazoo County, and Edward J. Hessler, Kalamazoo, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 264,593, May 18, 1981, Pat. No. 4,357,279. This application May 17, 1982, Ser. No. 378,939

Int. Cl.³ C07J 7/00

U.S. Cl. 260—397.45 18 Claims

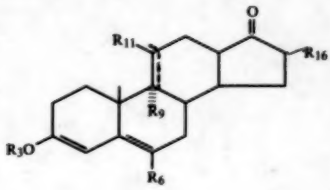
1. A process for the preparation of a corticoid of the formula



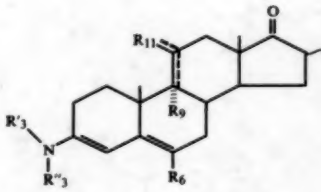
(XI)

which comprises

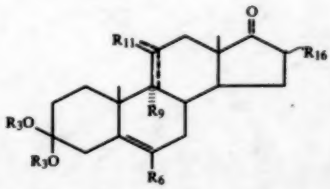
(1) contacting a protected 17-keto steroid selected from the group consisting of compounds of the formula



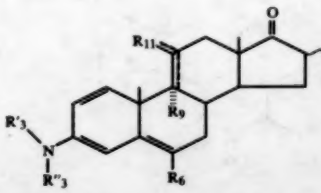
(IIa)



(IIb)

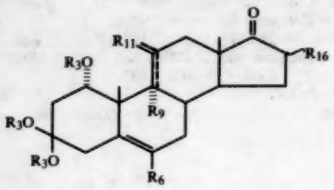


(IIc)



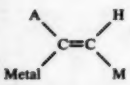
(IId)

-continued



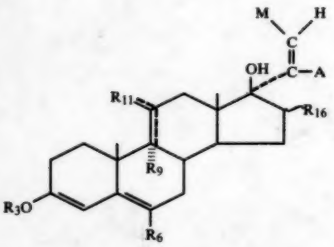
(IIe)

with a metallated 1,2-dihalogenated ethene of the formula

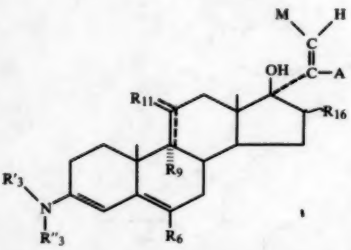


(III)

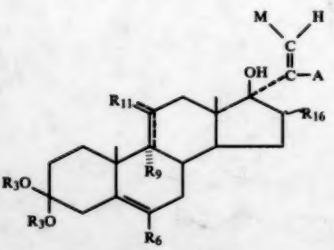
to form the corresponding protected C_{21}-steroid selected from the group consisting of compounds of the formula



(IVa)

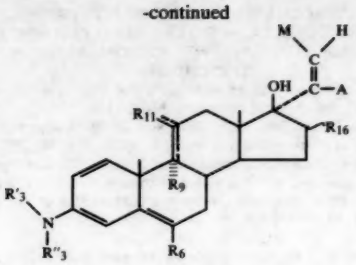


(IVb)

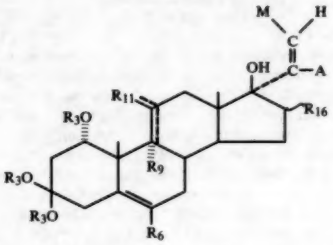


(IVc)

-continued



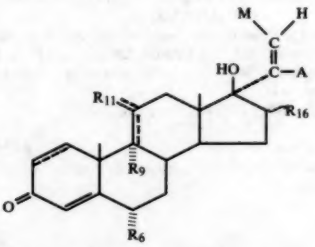
(IVd)



(IVe)

respectively;

(2) hydrolyzing the protected C_{21}-steroid (IVa-IVe) with acid to remove the protecting group and give a C_{21}-steroid of the formula

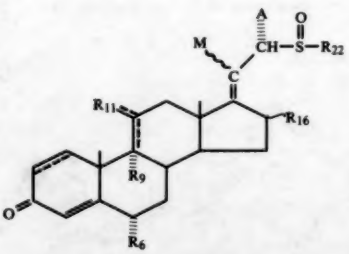


(V)

(3) contacting the C_{21}-steroid (V) with a sulfenylating agent of the formula

$$R_{22}—S—X \quad \text{(VI)}$$

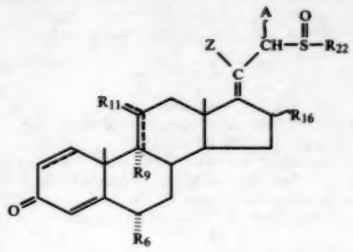
to give a 20,21-dihalo steroid of the formula



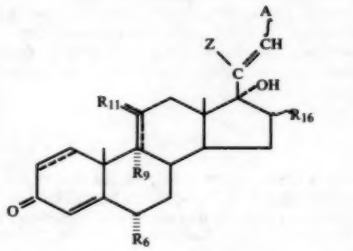
(VII)

(4) contacting the 20,21-dihalo steroid (VII) with a base selected from the group consisting of an alkoxide or mer-

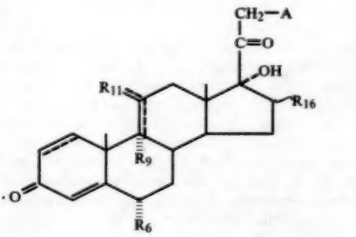
captide of the formula OR_{20}^-, or SR_{20}^-, respectively, to give a sulfoxide of the formula


(VIII)

(5) contacting the sulfoxide (VIII) with a thiophile to give a 20-unsaturated steroid of the formula


(IX)

(6) hydrolyzing the 20-unsaturated steroid (IX) with acid to give a 21-halo steroid of the formula


(X)

and

(7) contacting the 21-halo steroid (X) with an anion of the formula $R_{21}CO^{\ominus}$ where A is a fluorine, chlorine or bromine atom; M is a fluorine, chlorine or bromine atom; R_3 is alkyl of 1 thru 5 carbon atoms with the proviso that with the ketal (IIIc and IIIe), the R_3 groups can be connected to form the ethylene ketal; R_3' is alkyl of 1 thru 5 carbon atoms; R_3'' is alkyl of 1 thru 5 carbon atoms; R_6 is a hydrogen or fluorine atom or methyl group; R_9 is a hydrogen or fluorine atom, hydroxyl group, —OSi(R)$_3$ or nothing; R_{11} is H, H,H, H, β-OH, H, β-OSi(R)$_3$, or O; R_{16} is hydrogen atom or methyl group; R_{20} is alkyl of 1 thru 4 carbon atoms or phenyl; R_{21} is alkyl of 1 thru 4 carbon atoms or phenyl; R_{22} is alkyl of 1 thru 5 carbon atoms, trichloromethyl, phenyl, phenyl substituted with 1–4 carbon atoms or substituted with 1 thru 3 nitro or trifluoromethyl groups, aralkyl of 7 thru 12 carbon atoms or —N—(R_{122})$_2$ or phthalimide; X is a chlorine or bromine atom, phenylsulfone, phthalimide or imidazole group; Z is —OR_{20} or —SR_{20}; metal is lithium, sodium or potassium; ∞ indicates the attached group can be in either the α or β configuration; ---- is a single or double bond.

4,411,836

RACEMIZATION OF AN α-METHYL-β-ACYLTHIOPROPIONIC ACID

Naohito Ohashi, Nishinomiya; Shoji Nagata, and Junki Katsube, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

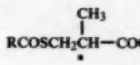
Division of Ser. No. 90,857, Nov. 2, 1979, Pat. No. 4,297,282. This application Jul. 2, 1981, Ser. No. 279,706

Claims priority, application Japan, Mar. 13, 1979, 54-29548

Int. Cl.[3] **C07C** *153/023*

U.S. Cl. 260—455 R **3 Claims**

1. A method for racemizing an optically active α-methyl-β-acylthiopropionic acid of the formula,



wherein R is a lower alkyl, phenyl or substituted phenyl bearing methyl or chloro radical, which comprises heating an optically active α-methyl-β-acylthio-propionic acid of the above mentioned formula at 100° C.–200° C., in the presence of 0.05–1 equivalent of a sodium, potassium, or calcium salt of a lower fatty or aromatic acid or a tertiary amine salt.

4,411,837

HALO, NITRO, AND HALONITRO S-ALKYL THIOCARBONATES

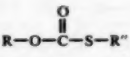
William H. Gilligan, Ft. Washington, Md., and Scott L. Stafford, Petersburg, Ak., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 224,776, Jan. 13, 1981, Pat. No. 4,332,744. This application Mar. 3, 1982, Ser. No. 354,261

Int. Cl.[3] **C07C** *154/00*

U.S. Cl. 260—455 B **13 Claims**

1. A compound of the formula



wherein R is selected from the group consisting of —$CH_2C(NO_2)_3$, —$CH_2CF(NO_2)_2$, —$CH_2CF_2(NO_2)$, —$CH_2CCl(NO_2)_2$, —CH_2CF_3, —CH_2CCl_3, —$CH_2C(NO_2)_2CH_3$, and —$CH_2CF_2CF_2H$, and wherein R'' is a lower alkyl group of from 1 to 6 carbon atoms.

4,411,838

UNSYMMETRICAL POLYNITROCARBONATES AND SYMMETRICAL 1,3-BIS(HALO- AND NITROALKYL CARBONYLDIOXY)-2,2-DINITROPROPANES AND METHODS OF PREPARATION

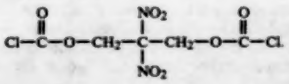
William H. Gilligan, Ft. Washington, Md., and Scott L. Stafford, Petersburg, Ak., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 224,776, Jan. 13, 1981, Pat. No. 4,332,744. This application Mar. 3, 1982, Ser. No. 354,260

Int. Cl.[3] **C07C** *69/96*

U.S. Cl. 260—463 **1 Claim**

1. A compound of the formula

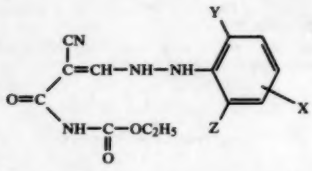


4,411,839
α-CYANO-β-(TRISUBSTITUTED PHENYLHYDRAZINO)-N-ETHOXYCARBONYLACRYLAMIDES

George R. Lindahl, III, Mountain View, and Clive A. Henrick, Palo Alto, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Continuation of Ser. No. 187,001, Sep. 15, 1980, abandoned. This application May 27, 1982, Ser. No. 382,527
Int. Cl.³ C07C *121/78*
U.S. Cl. 260—465 D 2 Claims

1. A compound of the following formula:



wherein each of X, Y and Z is independently selected from methyl, methoxy, chloro, fluoro, trifluoromethyl and methylthio.

4,411,840
PROCESS FOR THE RESOLUTION OF THE RACEMATE S-(CARBOXYMETHYL)-(RS)-CYSTEINE (B)

Horst Bethge; Axel Kleemann, both of Hanau, and Jürgen Martens, Alzenau, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 25, 1982, Ser. No. 411,326
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134106
Int. Cl.³ C07C *99/12*
U.S. Cl. 260—501.12 13 Claims

1. A process of resolving the racemate S-(carboxymethyl)-(RS)-cysteine comprising dissolving the racemate together with an optical isomer of 1-phenyl-ethylamine in a solvent in which the salt of said optical isomer with one of the isomer present, said racemate is less soluble than the salt of said optical isomer with the other one of the isomers present in said racemate and precipitating the less soluble salt.

9. A compound which is either (1) a salt of S-(carboxymethyl)-(R)-cysteine and (R)-1-phenylethylamine or (2) a salt of S-(carboxymethyl)-(S)-cysteine and (S)-1-phenyl-ethylamine.

4,411,841
PREPARATION OF NOVEL PERFLUORINATED SULPHONIC ACID FLUORIDES

Klaus Geisler, Bonn, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 28, 1981, Ser. No. 315,766
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1980, 3043427
Int. Cl.³ C07C *143/70*
U.S. Cl. 260—543 F 12 Claims

1. A compound selected from the group consisting of 4-oxa-3-trifluoromethyl-perfluoropentyl-1-sulphofluoride, 3-oxa-2-pentafluoroethyl-perfluorobutyl-1-sulphofluoride, 4-oxa-3-trifluoromethyl-perfluorohexyl-1-sulphofluoride, 3-oxa-2-pentafluoroethyl-perfluoropentyl-1-sulphofluoride, 4-oxa-3,5-bis-trifluoromethyl-perfluorohexyl-1-sulphofluoride, 3-oxa-2-pentafluoroethyl-4-trifluoromethylperfluoropentyl-1-sulphofluoride, 4-oxa-3-trifluoromethyl-6-pentafluoroethyl-perfluorodecyl-1-sulphofluoride, 3-oxa-2,5-bis-pentafluoroethyl-perfluorononyl-1-sulphofluoride, 4,7-dioxa-3-trifluoromethyl-perfluorooctyl-1-sulphofluoride, 3,6-dioxa-2-pentafluoroethyl-perfluoroheptyl-1-sulphofluoride, 4-oxa-3-trifluoromethyl-4-perfluorocyclohexyl-perfluorobutyl-1-sulphofluoride, 3-oxa-2-pentafluoroethyl-3-perfluorocyclohexyl-perfluoropropyl-1-sulphofluoride, 4-oxa-3-pentafluoroethyl-perfluoropentyl-1-sulphofluoride and 3-oxa-1-trifluoromethyl-2-pentafluoroethyl-perfluorobutyl-1-sulphofluoride.

4,411,842
OXIDATION OF ALKYL PHOSPHONOUS DICHLORIDES

Ingenuin Hechenbleikner, West Cornwall, and William P. Enlow, Falls Village, both of Conn., assignors to Borg-Warner Chemicals, Inc., Parkersburg, W. Va.

Filed Nov. 16, 1981, Ser. No. 321,857
Int. Cl.³ C07F *9/42*
U.S. Cl. 260—543 P 4 Claims

1. A method for preparing methylphosphonyl dichloride comprising contacting a mixture of from about 5% to about 25% of methylphosphonous dichloride and from about 75% to about 90% of phosphorus trichloride, at a temperature of from about −10° C. to about 60° C., with oxygen so as to oxidize the methylphosphonous dichloride but leave substantially all of the phosphorus trichloride unoxidized, and distilling the resulting product mixture to obtain the desired methylphosphonyl dichloride.

4,411,843
CONVERSION OF 1,1,1-TRICHLOROPERHALOALKANES INTO PERHALOALKANOYL CHLORIDES

Louis G. Anello, Hamburg; Richard E. Eibeck, Orchard Park, and Martin A. Robinson, East Amherst, all of N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 216,033, Dec. 15, 1980, Pat. No. 4,340,548. This application Apr. 29, 1982, Ser. No. 372,576
The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.
Int. Cl.³ C07C *51/58*
U.S. Cl. 260—544 Y 9 Claims

1. A process for preparation of perhaloalkanoyl chloride, which comprises contacting a 1,1,1-trichloroperhaloalkane wherein the 1,1,1-trichloroperhaloalkane is a straight or branched chain acyclic organic compound having 2 to 8 carbon atoms and having at least one trihalomethyl group wherein at least one halo atom is fluorine and having the remaining carbon atoms substituted by F, Br Cl or I atoms with an effective amount of a sulfur trioxide-containing substance selected from the group consisting of oleum, SO_3 and stabilized SO_3 in the presence of a catalytic amount of a halogen catalyst.

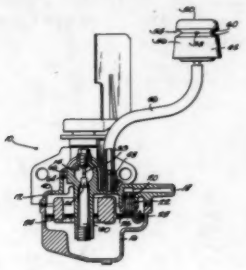
4,411,844
PRIMING SYSTEM FOR A VENTED BOWL CARBURETOR

Richard L. Morris, Galesburg, and Ronald B. Lloyd, Gilson, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Feb. 11, 1982, Ser. No. 347,909
Int. Cl.³ F02M *1/16*
U.S. Cl. 261—34 R 5 Claims

1. An internal combustion engine including a carburetor for supplying the engine with a rich fuel-air mixture during priming and with a leaner mixture during normal operation, said carburetor including a body with a fuel-air mixture passage, a float bowl adapted to contain a quantity of liquid fuel and having an air space above the liquid fuel, said float bowl including an air inlet, a fuel nozzle for conducting fuel from the float bowl to the fuel-air mixture passage, a primer for aiding in starting the engine, the primer including means for selectively forcing air into said air space to cause the air pressure in said air space to be greater than atmospheric pressure and to cause

liquid fuel to be forced through said nozzle and into said fuel-air mixture passage, said means for forcing including a flexible priming bulb adapted to be compressed to cause air to be forced into said air space and including a flexible wall portion



including a groove and said priming bulb including a vent opening located in said groove so as to close as said priming bulb is compressed and as air is forced into the air space of the float bowl, and a conduit between the priming bulb and the air inlet.

4,411,845

THROTTLE VALVE ASSEMBLY

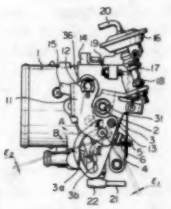
Toshio Tanahashi, Toyota; Sinya Sumitani, Kariya; Takeo Matuura, Kariya; Shinji Ichikawa, Kariya, and Takao Okuno, Toyota, all of Japan, assignors to Nippondenso Co., Ltd., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed May 24, 1982, Ser. No. 381,509

Claims priority, application Japan, May 30, 1981, 56-81836

Int. Cl.³ F02M *19/12*

U.S. Cl. 261—65 **8 Claims**



1. An improved throttle valve assembly of the type which includes a throttle body having an intake passage therein, a throttle shaft journalled on said throttle body across said intake passage, a throttle lever secured to said throttle shaft, a throttle valve mounted on said throttle shaft for regulating the flow rate of the intake air flowing through said passage, and a second, intermediate lever pivoted on said throttle body and adapted to be moved via a throttle linkage by an accelerator, one of said throttle lever and second lever having an arcuated cam slot engaging with a roller mounted rotatably on the other lever for interconnecting said levers with each other, and in which the cam profile of said cam slot is arranged so that when the accelerator is stepped on, the angular position of the throttle valve varies in response to the travel of the accelerator according to a predetermined functional relationship, wherein the improvement comprises: means disposed between sai throttle lever and second lever for adjusting a clearance existing between said cam slot and roller at the idle position of said throttle valve to below the tolerable value.

4,411,846

APPARATUS FOR ABSORBING GASES

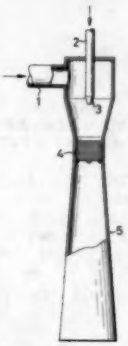
Michael Ulrich, Kelkheim; Manfred Trautmann, Frankfurt am Main; Günter Heck, Wiesbaden, and Egon Malow, Hochheim am Main, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 29, 1980, Ser. No. 125,882

Claims priority, application Fed. Rep. of Germany, Mar. 2, 1979, 2908263

Int. Cl.³ B01D *47/16*

U.S. Cl. 261—98 **3 Claims**



1. Jet Venturi apparatus for absorbing a gas by a washing liquid comprising

gas conduit means for injecting said gas;

atomizing means for injecting said liquid as a spray into the injected gas;

a tube coupled to said gas conduit means for carrying the gas and liquid spray and having a length and a diameter whose ratio is in the range of from 5:1 to 50:1; and

diffuser means disposed in the tube and having a throat in the tube at the end thereof adjacent said gas conduit means for disrupting the flow of said gas and liquid spray as the same pass through said tube so at to disperse droplets of said liquid spray to increase the specific surface area of said liquid spray, said diffuser means including a stack of packings extending across the cross-sectional area of said tube at said throat, the stack having a length not in excess of the diameter of the tube.

4,411,847

PROCESS FOR SURFACE MODIFIED HOLLOW MICROSPHERES

David I. Netting, Springfield; Bruce D. Spivack, Norristown, and James P. Cunnion, Jr., Bridgeport, all of Pa., assignors to PQ Corporation, Valley Forge, Pa.

Division of Ser. No. 161,473, Jun. 20, 1980, Pat. No. 4,340,642. This application May 27, 1982, Ser. No. 382,826

Int. Cl.³ B29C *25/00*

U.S. Cl. 264—7 **12 Claims**

1. A process for preparing water resistant hollow microspheres being characterized by:

a. preparing a slurry of hollow microspheres in sufficient water to prevent shearing stress, said microspheres having 0.02 to 2.0 parts by weight of polysalt solids for each part by weight of sodium silicate solids, said sodium silicate having 1.5 to 4.0 moles of SiO_2 per mole of Na_2O, a particle size of 35 to 2000 microns, a bulk density of 2 to 20 lbs/cu.ft. and less than 7% moisture;

b. stirring said slurry while adding a solution of a salt of a multivalent metal and a strong acid, said multivalent metal being one that decreases the solubility of the microspheres

in water, the rate of addition of said solution being controlled in a pH range that promotes the yield of intact microspheres with the desired decreased water solubility;

c. stirring after the addition of the multivalent metal salt solution is complete;

d. separating the floating microspheres from the slurry; and

e. washing, drying and recovering the desired product.

4,411,848

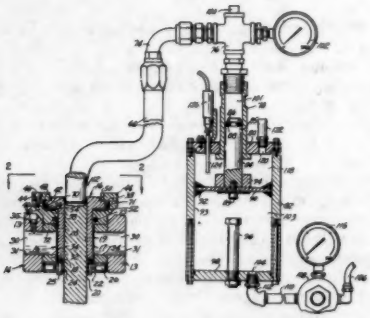
METHOD FOR COMPACTING ARTICLES MADE OF POWDER MATERIAL AT A PREDETERMINED DENSITY

Raymond P. DeSantis, Troy, Mich., assignor to PTX-Pentronix, Inc., Lincoln Park, Mich.

Division of Ser. No. 269,512, May 28, 1981, Pat. No. 4,362,483. This application Nov. 9, 1981, Ser. No. 319,246

Int. Cl.³ B29F *3/04*

U.S. Cl. 264—40.5 **21 Claims**



1. A method for compacting powder material into an article of a predetermined density in a powder compacting apparatus having a reciprocable ram supporting a punch for compacting said powder material in a die cavity against a die cavity closure wall, and means for reciprocating said ram, said method comprising coupling said means reciprocating said ram to the ram by way of a variable volume chamber whose volume varies between a maximum and a minimum, introducing a pressurized fluid in said variable volume chamber such as to expand said chamber to its maximum volume, adjusting the pressure of said pressurized fluid at a predetermined value, adjusting the stroke of said ram such that compacting of said article by said punch in said die cavity at maximum stroke of said ram causes said variable volume chamber to be contracted by the force of compaction to a volume intermediary between its maximum and minimum volumes, and compacting said article by reciprocation of said punch-supporting ram by said reciprocating means while maintaining said variable volume chamber at said volume intermediary between its maximum volume and its minimum volume.

4,411,849

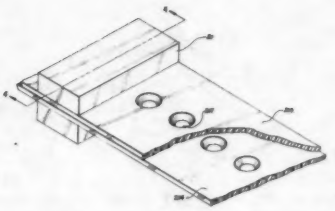
METHOD FOR FORMING A PLURALITY OF OBJECTS FROM A PLURALITY OF SUPERIMPOSED SHEETS

Lou Kohl, Palatine; John R. Peschke, Woodstock, and Sheldon M. Wecker, Libertyville, all of Ill., assignors to James River-Dixie/Northern, Inc., Greenwich, Conn.

Filed Aug. 3, 1981, Ser. No. 289,388

Int. Cl.³ B29D *27/00*; B29H *21/04*

U.S. Cl. 264—45.5 **18 Claims**



1. A process for forming a plurality of stacked objects simultaneously from a plurality of separable superimposed sheets of deformable and fusible material comprising the steps of heating said plurality of separable superimposed sheets until said material in said sheets reaches a temperature sufficient to allow plastic deformation while maintaining molding conditions at the contiguous surfaces thereof below those resulting in fusing of portions of said contiguous surfaces and forming said plurality of separable superimposed sheets simultaneously to form a plurality of stacked objects.

4. The process of claim **1** further comprising the step of first forming a roll of interleaved separable sheet material having a plurality of separable sheet material interleaved therein by superimposing multiple sheets of separable material in aligned registration and rolling same about a common axis, and feeding said separable interleaved sheet material from said roll for said heating and forming steps.

5. The process of claim **4** further comprising the steps of extruding a tubular foamed plastic cylinder, slitting said extruded cylinder to form separable multiple sheets thereof, superimposing said separable multiple sheets, and winding said separable multiple sheets onto a single core to produce an interleaved roll of separable foamed plastic sheets for continuous feed to said heating and forming steps.

9. The process of claim **5** further comprising the step of extruding foamed polystyrene sheet and forming skins on the surface of the foam sheet by means of cooling said surface with a cooled gas flow, and coating the surface of said extruded foamed polystyrene sheet with releasing agent by injecting said releasing agent with said gas flow.

4,411,850

Patent Not Issued For This Number

4,411,851

METHOD FOR MAKING FRICTION MATERIAL WITHOUT ASBESTOS FIBERS INCLUDING REPEATED PRESSING AND DEGASSING STEPS

Toshiaki Sakabe; Yasuhiro Matsumoto, and Hisami Tsujio, all of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha and Aisin Kako Kabushiki Kaisha, both of Kariya, Japan

Filed Oct. 20, 1981, Ser. No. 312,966
Claims priority, application Japan, Oct. 29, 1980, 55-151628
Int. Cl.³ B29D 3/02; B29G 1/00
U.S. Cl. 264—137 9 Claims

1. A method of producing a friction material, comprising the steps of:

(a) impregnating a fiber base material with a binder, said fiber being other than asbestos fiber and being stable to heat without reduction in weight and in volume in an atmosphere at 300° C.;

(b) shaping the impregnated fiber into the predetermined shape of a crude friction material;

(c) inserting said shaped material into the cavity of a mold which has been heated to a predetermined temperature;

(d) pressure/heat treating said shaped material by compressing the shaped material for 2 to 10 seconds at a predetermined pressure and at a predetermined temperature in a closed mold and degassing the compressed shaped material for 0.5 to 2 seconds in an open mold; and

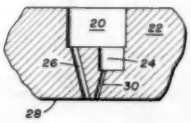
(e) repeating the cycle of the two steps of step (d) 10 to 20 times.

4,411,852

SPINNING PROCESS WITH A DESENSITIZED SPINNERET DESIGN

James E. Bromley, Pensacola, Fla., and John R. Dees, Charlotte, N.C., assignors to Fiber Industries, Inc., Charlotte, N.C.

Filed Feb. 18, 1982, Ser. No. 349,794
Int. Cl.³ B29F 3/10
U.S. Cl. 264—171 2 Claims



1. A process for melt-spinning through a spinneret having at least one combined orifice comprising first and second capillaries having different cross-sectional areas, said process comprising:

(a) separately metering a first polymer stream to said first capillary through a first metering passageway; and

(b) separately metering a second polymer stream to said second capillary through a second metering passageway, each of said passageways having dimensions to provide a pressure drop thereacross at least twice as large as the pressure drop across the capillary with which each passageway is associated whereby the polymer volumetric flows through said first and second capillaries are substantially insensitive to the dimensions of said capillaries.

4,411,853

POLYMER STABILIZATION

Jerry O. Reed, and Ronald D. Mathis, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 11, 1982, Ser. No. 377,212
Int. Cl.³ C08K 5/58, 5/57
U.S. Cl. 264—176 F 18 Claims

1. A resin composition exhibiting improved heat stability comprising a poly(arylene sulfide) resin containing an effective stabilizing amount sufficient to retard resin curing and cross-linking of at least one of the group consisting of dialkyltin dicarboxylates, dibutyltin-S,S'-bis(isooctyl thioacetate) and di-n-butyl tin S,S¹-bis(isooctyl 3-thiopropionate).

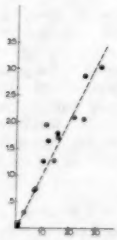
14. In a process for melt extruding a poly(arylene sulfide) resin, the improvement for reducing gel formation during melt extrusion which comprises incorporating into said resin an effective heat stabilizing amount of at least one of the group consisting of dialkyltin dicarboxylates dibutyltin-S,S'-bis-(isooctyl thioacetate) and di-n-butyl tin S,S¹-bis(isooctyl 3-thiopropionate, which amount is sufficient to retard curing and cross-linking of said resin during melt extrusion and thereby minimizing plugging of filters and spinnerets with gel.

4,411,854

PROCESS FOR THE PRODUCTION OF FILAMENTS WITH HIGH TENSILE STRENGTH AND MODULUS

Franciscus H. J. Maurer, Voerendaal; Jacques P. L. P'ijpers, Limbricht, both of Netherlands, and Paul Smith, Grenoble, France, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Dec. 15, 1981, Ser. No. 331,080
Claims priority, application Netherlands, Dec. 23, 1980, 8006994
Int. Cl.³ D01F 6/00
U.S. Cl. 264—205 5 Claims



1. Process for the production of filaments with a high modulus and high tensile strength comprising the steps of,

(a) preparing a filler containing solution of a linear polyethylene with a weight-average molecular weight of at least about 400,000,

(b) spinning said filler containing solution of step (a) to form a filament by cooling without substantial evaporation of solvent to form a gel, and

(c) stretching said filament at a stretching ratio of at least about $12 \times 10^6/M_w + 1$.

4,411,855
METHOD FOR MAKING PERFUME-RELEASE PLASTIC DECORATIONS

August E. Fiebig, Jr.; Glenn A. Shurney, both of Chicago, and Anton J. Nagy, Crestwood, all of Ill., assignors to Alberto-Culver Company, Melrose Park, Ill.

Filed Aug. 31, 1981, Ser. No. 296,580
Int. Cl.[3] B29C 5/10, 9/00
U.S. Cl. 264—219 4 Claims

1. The method of manufacturing a perfume releasing plastic decoration having the appearance of a stained glass miniature comprising:

(a) positioning a flat shallow frame on the upper surface of a horizontally-disposed plate, said plate being formed of heat conductive metal, said frame providing multiple openings therethrough enclosed on their sides by ribs of said frames and on their bottoms by said plate, said frame being positioned on said plate with the bottom sides of said frame ribs in smooth contacting engagement with the upper surface of said plate;

(b) applying radiant heat to the underside of said plate for transfer therethrough to preheat the upper surface of said plate and said frame thereon;

(c) while applying heat to said plate filling a plurality of said frame openings with predetermined quantities of one or more flowable thermoplastic compositions containing thermoplastic resin as a principal ingredient, said filled compositions being in contact with the upper surface of said plate, at least one of said compositions being colored and light-transmitting, and at least one of said compositions containing a volatile perfume oil which is capable of being slowly released at ordinary room temperatures from its composition, said perfume-releasing compositions containing from 5 to 35 parts by weight of said volatile perfume oil per each 50 to 95 parts of said thermoplastic resin;

(d) causing said filled quantities of said compositions to spread outwardly on said plate upper surface into conforming engagement with the enclosing frame ribs;

(e) applying a cooling fluid to the underside of said plate to remove heat from said plate and said filled frame thereon to set said compositions within said frame openings in interlocking engagement with said frame ribs; and

(f) removing said filled frame from said plate.

4,411,856
METHOD AND APPARATUS FOR HIGH SPEED MANIFOLDING OF HONEYCOMB STRUCTURES

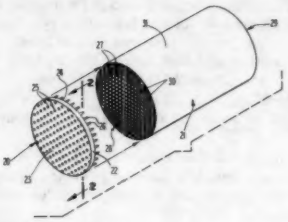
Max R. Montierth, Elmira, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 15, 1981, Ser. No. 283,734
Int. Cl.[3] B29D 3/00
U.S. Cl. 264—267 13 Claims

1. A method of manifolding a subset of cells of a honeycomb structure having a multiplicity of open end cells extending therethrough from a honeycomb surface thereof comprising the steps of:

providing a flexible mask having a first plurality of flexible protrusions extending from an outer surface thereof, and a second plurality of openings extending completely therethrough from said outer surface to an opposing surface thereof;

fitting said outer surface of said mask against said honeycomb surface of said structure with said first plurality of



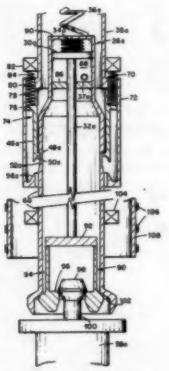
protrusions extending into an equal plurality of said cells and said second plurality of openings aligned opposite said subset of cells; and

charging a plugging material through said plurality of openings into the open ends of said subset of cells.

4,411,857
NUCLEAR REACTOR CONTROL APPARATUS

Bettadapur N. Sridhar, Cupertino, Calif., assignor to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Apr. 16, 1981, Ser. No. 254,709
Int. Cl.[3] G21C 7/08
U.S. Cl. 376—233 8 Claims



2. Apparatus for controlling fission in a nuclear reactor core, comprising:

a vertically disposed shaft carrying a neutron absorber and mounted for longitudinal reciprocation between a raised position wherein it holds the absorber above the reactor core and a lowered position wherein it locates the absorber within the reactor core, said shaft having a recess in its outer side surface;

a latch disposed adjacent the outer side of said shaft and movable between a raised shaft holding position and a lowered shaft releasing position, said latch comprising (1) a detent element movable toward and away from said shaft, said detent element being positioned in the recess in said shaft when said latch is in its shaft-holding position to thereby prevent movement of the shaft to its lowered position, and (2) a first cam element projecting below said detent element; and

a second cam element spaced below said latch when the latter is in its shaft-holding position, said second cam

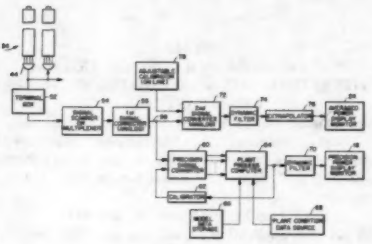
element being arranged so that when said latch moves to its shaft-releasing position, it engages said first cam element and moves said detent element out of the recess in said shaft, whereby the shaft is allowed to move to its lowered position.

4,411,858

POWER PERFORMANCE MONITORING SYSTEM FOR NUCLEAR REACTOR FUEL CORE

Robert D. Smith, Bethesda, Md., assignor to Scandpower, Inc., Bethesda, Md.

Filed Jan. 30, 1981, Ser. No. 229,797
Int. Cl.³ G21C 17/00
U.S. Cl. 376—247 6 Claims



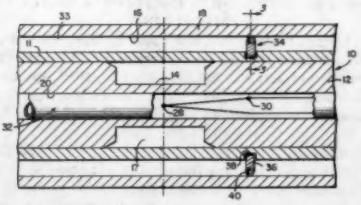
1. In a method of monitoring power developed in a nuclear reactor by generating power measurement signals in response to fission products produced by groups of fuel rods and processing said signals together with data relating to a plurality of parameters associated with the nuclear reactor to produce a precision power shape readout that is intermittantly interrupted, the improvement residing in the selection of sensors which internally generate heat in response to gamma radiation resulting from said fission products whereby the measurement signals are directly related to linear power generation rate of the fuel rods; separately processing said signals without said data to produce a second but continuous power shape readout that is available during the interruptions in the first mentioned precision power shape readout; and calibrating the separately processed signals in accordance with the precision power shape readout to correct the second continuous power shape readout.

4,411,859

GAMMA SENSOR HAVING COMBINED THERMAL BRIDGE AND CENTERING MEANS

Robert D. Smith, Bethesda, Md., and Pierre Regazzoni, Boulonge-Billancourt, France, assignors to Scandpower, Inc., Bethesda, Md.

Continuation-in-part of Ser. No. 48,033, Jun. 13, 1979, Pat. No. 4,356,061. This application May 28, 1981, Ser. No. 267,912
Int. Cl.³ G21C 17/00
U.S. Cl. 376—247 10 Claims



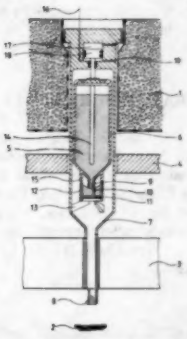
9. In combination with a gamma sensor positioned within a tubular guide of a fuel assembly in a nuclear reactor, said sensor having an elongated gamma radiation heated body provided with relatively hot and cold regions and an outer sheath in thermal contact with said body along the cold regions thereof to establish axially symmetrical heat distribution therein in response to uniform external cooling of the outer sheath within an annular gap between said outer sheath and the tubular guide, the improvement residing in thermal bridge means engageable with the tubular guide within the annular gap for establishing a thermally conductive path between the outer sheath and the tubular guide, said thermal bridge means being formed by portions of the outer sheath radially deformed into thermal contact with the tubular guide at a location in axially spaced adjacency to the hot region of the body for preventing disturbance of said symmetrical heat distribution.

4,411,860

PEBBLE BED REACTOR WITH FEEDING DEVICE FOR ABSORBER MATERIAL AND METHOD FOR ITS OPERATION

Herbert Reutler, Cologne; Ulrich Müller-Frank, Bergisch-Gladbach; Manfred Ullrich, Bergisch-Gladbach, and Hubert Schepers, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to GHT, Gesellschaft für Hochtemperaturreaktor-Technik mbH, Bergisch-Gladbach, Fed. Rep. of Germany

Filed Mar. 12, 1981, Ser. No. 242,919
Claims priority, application Fed. Rep. of Germany, Mar. 22, 1980, 3011218
Int. Cl.³ G21C 7/14
U.S. Cl. 376—338 4 Claims



1. Pebble-bed nuclear reactor capable of being shut down by a fluidized mass of bodies containing neutron-absorbing material, the fluidized mass of bodies being received in a storage container disposed above the pebble bed during normal operation of the reactor, the storage container being formed with a closable discharge opening, comprising a piston rigidly connected to the storage container and disposed below the discharge opening thereof, said piston being guided in a cylinder stationary relative to the reactor and being open at the top thereof, the storage container being displaceable in vertical direction between upper and lower end positions thereof, said piston in said upper end position of the storage container, closing off said cylinder at the upper edge located at said open top of said cylinder and, in said lower end position of the storage container, the fluidized mass of bodies discharged from the discharge opening of the storage container being formed on top of said piston into a discharge cone having a height greater than the distance between said piston and the discharge opening.

4,411,861
METHOD FOR PROTECTING THE CASING TUBES OF NUCLEAR REACTOR FUEL RODS

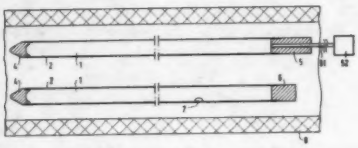
Eckard Steinberg, Erlangen, Fed. Rep. of Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mülheim an der Ruhr, Fed. Rep. of Germany

Continuation of Ser. No. 934,358, Aug. 17, 1978, abandoned. This application Apr. 1, 1981, Ser. No. 250,047

Claims priority, application Fed. Rep. of Germany, Aug. 19, 1977, 2737532

Int. Cl.³ G21C *3/06*

U.S. Cl. 376—417 **9 Claims**



1. Method for protecting a zirconium-alloy cladding tube of a nuclear-reactor fuel rod against attack by radioactive fission products, such as iodine especially, which comprises applying an excess pressure to the interior of the cladding tube above the pressure existing outside the cladding tube at a temperature of from 300° to 500° C. so as to widen the cladding tube, depending upon the geometric dimensioning thereof, in the elastic range and up to nearly the yield point thereof beyond the normal expansion during reactor operation, while this condition exists, reacting a medium previously introduced into the interior of the cladding tube with the inner surface of the cladding tube to form a protective layer, and thereafter reducing the temperature and excess pressure so that the cladding tube returns to its original shape.

4,411,862
SPACER GRATING FOR FUEL ELEMENT IN A NUCLEAR REACTOR

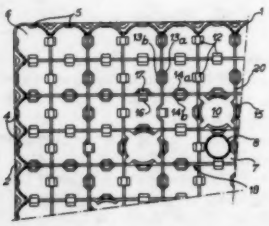
Joseph Leclercq, St. Didier; Jacques Le Pargneux, Lyons; Claude Feutrel, Vauhallan; Guy Lestiboudois, Paris, and Michel Chantant, Bois d'Arcy, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 21, 1981, Ser. No. 226,895

Claims priority, application France, Jan. 22, 1980, 80 01304

Int. Cl.³ G21C *3/34*

U.S. Cl. 376—442 **18 Claims**



1. Spacer grating for a fuel assembly used in a nuclear reactor constituted by intersecting plates in square-mesh lattice form, in the cells of which pass the fuel pencils for transverse holding thereof, these pencils constituting a bundle where certain pencils are replaced by guide tubes, the plates which constitute the walls of the cells bearing elements for holding the fuel pencils projecting inside the cells, of two types, namely, on the one hand, rigid stops and, on the other hand, springs adapted to exert transverse forces on the fuel pencils, added to the grating and disposed around the plates so that each of the faces of each cell containing a pencil bears an element of type different from that borne by the opposite face, wherein said grating comprises:

on the greater part of the walls equipped with springs, double springs comprising two active parts on either side of the wall on which the double spring is placed, allowing the symmetrical action of this spring on two different pencils inside two adjacent cells;

on the other walls equipped with springs, single springs comprising one active part only disposed in one of the two cells separated by the wall on which is placed the spring of which the other part is not capable of coming into contact with a fuel pencil;

rigid stops made on the plates of the grating independently of the springs.

4,411,863
LOW-CARAT CORROSION-RESISTANT GOLD ALLOY WITH THE SKIN OF THE ALLOY NOT BEING BLACKED UPON CASTING

Masasuke Otsuka, 14-8, Okusawa 5-Chome, Setagaya-ku, Tokyo; Hideyo Maniwa, 76, Matsugaoka, Kanagawa-ku, Yokohama-shi, Kanagawa-ken, Tokyo, and Shinya Nishina, Naka-so 201, 19-7, Sakura 2-Chome, Setagaya-ku, Tokyo, all of Japan

Filed Jun. 24, 1982, Ser. No. 391,941

Claims priority, application Japan, Jun. 23, 1981, 56-95969

Int. Cl.³ C22C *5/06*

U.S. Cl. 420—580 **1 Claim**

1. A low-carat corrosion-resistant gold alloy, with the skin of the alloy not being blacked upon casting, characterized by the contents of gold in the range from 0.5 to 35 weight percent, palladium in the range from 15 to 35 weight percent, indium in the range from 7 to 18 weight percent, zinc in the range from 0 to 10 weight percent, tin in the range of 0 to 10 weight percent, the balance being silver.

4,411,864
CU-AG-SI BASE ALLOY BRAZING FILLER MATERIAL

Masaki Morikawa; Hideaki Yoshida, both of Kasukabe; Kunio Kishida, Ohmiya, and Chuji Tanaka, Ageo, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP81/00338, § 371 Date Jul. 30, 1982, § 102(e) Date Jul. 30, 1982, PCT Pub. No. WO82/02013, PCT Pub. Date Jun. 24, 1982

PCT Filed Nov. 18, 1981, Ser. No. 406,236

Claims priority, application Japan, Dec. 8, 1980, 55/172965

Int. Cl.³ C22C *30/02*

U.S. Cl. 420—587 **8 Claims**

1. A Cu-Ag alloy brazing filler material having excellent cold workability and brazability and a low vapor pressure comprising from more than 35 to 50% by weight of Ag, 2.2 to 6% by weight of Si, with the balance being Cu and incidental impurities.

4,411,865
METHOD OF CORROSION INHIBITION IN AQUEOUS MEDIUMS

Gary E. Geiger, Philadelphia, and Roger C. May, Glenside, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.

Continuation of Ser. No. 131,593, Mar. 19, 1980, abandoned, which is a continuation-in-part of Ser. No. 27,346, Apr. 5, 1979, abandoned. This application May 28, 1981, Ser. No. 267,840

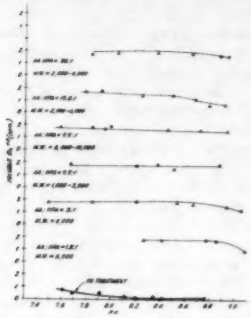
Int. Cl.³ C23F *11/04*

U.S. Cl. 422—16 **23 Claims**

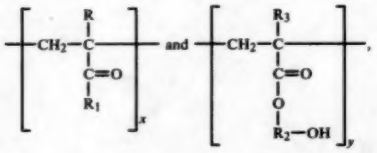
1. A method for reducing the amount of corrosion of metal surfaces in contact with an aqueous medium prone to zinc precipitation comprising adding to said aqueous medium an effective amount for the purpose of effective:

(i) water-soluble zinc compound,

(ii) water-soluble chromate compound, and
(iii) water-soluble polymer comprising moieties derived



from acrylic acid or water-soluble salt thereof and moieties of hydroxylated lower alkyl acrylate, wherein the moieties of said polymer have the following formulas:



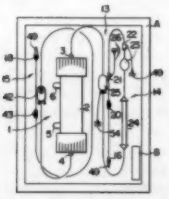
wherein R is hydrogen or a lower alkyl of from 1 to 3 carbon atoms; R_1 is OH, NH_2 or OM where M is a water-soluble cation; R_2 is a lower alkyl of from about 2 to 6 carbon atoms, R_3 is H or lower alkyl of from 1 to 3 carbon atoms and the mole ratio of x:y is 1:4 to 36:1, said polymer being capable of retaining a corrosion inhibiting amount of said zinc compound in soluble form in said aqueous medium.

4,411,866

STEAM STERILIZATION METHOD FOR ARTIFICIAL ORGAN ASSEMBLIES AND RESULTANT STERILIZED PRODUCT

Michio Kanno, Higashikurume, Japan, assignor to Terumo Corporation, Tokyo, Japan

Continuation of Ser. No. 133,815, Mar. 25, 1980, abandoned. This application Dec. 30, 1981, Ser. No. 335,862
Claims priority, application Japan, Mar. 28, 1979, 54-36728
Int. Cl.³ A61L *2/06;* **B65D** *81/20*
U.S. Cl. 422—25 **2 Claims**



1. A steam sterilization method for an artificial organ assembly which includes an artificial organ having a built-in body fluid treatment mechanism which has a body fluid inlet port and a body fluid outlet port, comprising:

connecting a body fluid inlet line of an extracorporeal body fluid circulation mechanism to said body fluid inlet port;

connecting a body fluid outlet line of said extracorporeal body fluid circulation mechanism to said body fluid outlet port;

said extracorporeal body fluid circulation mechanism including a drip chamber and a pump tube coupled between said inlet and outlet lines;

filling said artificial organ and said extracorporeal body fluid circulation mechanism with a liquid harmless to the human body, and sealing said artificial organ and extracorporeal body fluid circulation mechanism;

at least one of said artificial organ and said extracorporeal body fluid circulation mechanism having an expandable member;

hermetically accommodating, enclosing and vacuum-packing said artificial organ and extracorporeal body fluid circulation mechanism in a sealed steam permeable package in a vacuum-packed state without water disposed between said package and said organ and extracorporeal body fluid circulation mechanism;

said package, artificial organ and extracorporeal body fluid circulation mechanism comprising said artificial organ assembly; and

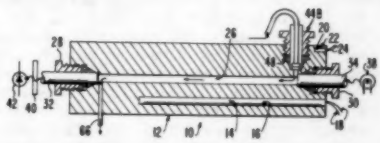
steam sterilizing said artificial organ assembly in the sealed vacuum-packaged state at a temperature ranging from 100° to 130° C. and under a pressure ranging from 1 to 3 kg/cm^2 of pressure (gauge pressure), wherein any expansion of said harmless liquid during the steam-sterilization is absorbed by said expandable member and any gas generated by the steam-sterilization can be trapped in said drip chamber of said extracorporeal body fluid circulation mechanism.

4,411,867

REDUCTION GAS DETECTOR

Clinton R. Ostrander, 140 Stanford Ave., Menlo Park, Calif. 94025

Continuation-in-part of Ser. No. 129,938, Mar. 13, 1980, abandoned. This application Aug. 10, 1981, Ser. No. 291,212
Int. Cl.³ G01N *21/75*
U.S. Cl. 422—91 **7 Claims**



1. Apparatus for detecting gases by measuring the spectral absorption of mercury vapor in ultraviolet radiation comprising: an elongated body of metallic material, said body having a bore therein defining a sample cell; means connected to said body and in heat exchange relationship thereto for heating the body; means including a first quartz rod extending into one end of the bore for directing ultraviolet radiation from a source into and through the sample cell; means including a second quartz rod extending into the opposite end of the bore for directing ultraviolet radiation out of the sample cell and to a photodetector, said body having a fluid passage extending transversely of and communicating with said bore near the inner end of the first quartz rod, the fluid passage having an open outer end, said body further having an outlet line communicating with said bore near the inner end of the second quartz rod; a fitting removably coupled to said body and extending into said fluid passage, said fitting having an inner end provided with a recess; means in said recess for defining a mercuric oxide bed in intersecting relationship to the path of fluid flow through said fluid passage, said bed defining means including a pair of perforate, planar screens, a tubular spacer

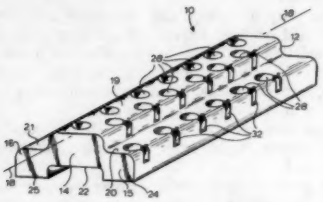
between the screens, a mass of mercuric oxide in the spacer and between the screens, and a tubular retained for holding the screens and spacer in the recess, whereby a gas may enter the passage and flow through said bed to generate mercury vapor for flow into said sample cell.

4,411,868

MULTIPLE TUBE RACK

W. L. Noack, Camarillo, Calif., assignor to Becton, Dickinson and Company, Paramus, N.J.

Filed Dec. 11, 1981, Ser. No. 329,779
Int. Cl.³ B01L 9/06
U.S. Cl. 422—104 **5 Claims**



1. A rack for holding a plurality of tubes comprising:

a substantially planar, relatively thick, one-piece support member made of thermoformed material having a center portion and a side portion along each side of the center portion, all of said portions extending substantially parallel to each other along the longitudinal axis of said support member, said center portion having an upper surface raised above the upper surfaces of said side portions and having a lower surface raised above the lower surfaces of said side portions;

a plurality of holes for receiving tubes therein in each of the aforementioned portions, said holes extending partially through said respective portions thereby forming closed bottoms thereof, said holes being tapered toward said bottom surfaces within the respective portions, all of said holes arranged in staggered fashion in said portions so that no adjacently lying holes are aligned on an axis substantially perpendicular to said longitudinal axis of said support member, all of said holes extending sufficiently deep into said respective portions to permit tubes positioned therein to stand upright without further support; and

a slot adjacent each hole and communicating therewith, each of said slots extending partially through said respective portions to provide a view into the interior of its associated hole.

4,411,869

MULTIPLE STAGE REACTOR SYSTEM

Joseph A. Kroushl, Westchester, and Arthur R. Greenwood, Niles, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 334,502, Dec. 28, 1981. This application Feb. 28, 1983, Ser. No. 470,428
Int. Cl.³ B01J 8/12
U.S. Cl. 422—188 **20 Claims**

1. A multiple stage reactor system which comprises, in combination:

(a) a vertically elongated confined reactor vessel;

(b) at least two vertically spaced reaction chambers within said vessel, each having upper and lower extremities;

(c) a first port and a second port associated with each chamber, both located in one of said extremities;

(d) each of said chambers containing a plurality of side-by-side annular-form vertically aligned catalyst-retaining sections positioned therein;

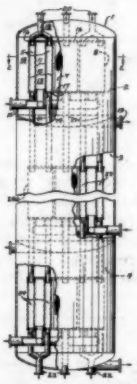
(e) each of said catalyst-retaining sections being defined by an inner tubular-form catalyst-retaining screen coaxially disposed within an outer vertically positioned tubular-form catalyst-retaining screen, said inner catalyst-retaining screen further defining a fluid flow conduit within the inner space thereof;

(f) each of said chambers containing a first flow manifold connecting said first port to one extremity of each of said fluid flow conduits;

(g) each of said catalyst-retaining sections being further defined by two transverse partitions, one connected to the upper extremity of said fluid flow conduit and to the upper perimeter of said outer catalyst-retaining screen, and the other connected to the lower extremity of said fluid flow conduit and to the lower perimeter of said outer catalyst-retaining screen;

(h) each of said chambers having a void space in open communication with said second port, and defined by the inner walls of said chamber and the outer surfaces of the plurality of catalyst-retaining sections contained therein, said void space serving as a second flow manifold connecting the outer surface of said plurality of catalyst-retaining sections to said second port;

(i) catalyst inlet conduits extending through the upper extremity of the uppermost chamber and connected in open communication with the upper extremity of each of the catalyst-retaining sections contained therein;



(j) inter-chamber catalyst conduits connecting the lower extremity of each catalyst-retaining section in each reaction chamber, except the catalyst-retaining sections in the lowermost chamber, in open communication with the upper extremity of a catalyst-retaining section in the next lower chamber; and,

(k) catalyst withdrawal conduits connected in open communication with the lower extremity of each of the catalyst-retaining sections contained in the lowermost chamber and extending through the lower extremity thereof, whereby catalyst particles are gravitated through said vertically spaced reaction chambers via the plurality of catalyst-retaining sections contained therein.

10. A process for the conversion of a hydrocarbon charge stock characterized in that the hydrocarbon charge stock is passed in vapor phase to a multiple stage reactor system comprising, in combination:

(a) a vertically elongated confined reactor vessel;

(b) at least two vertically spaced reaction chambers within said vessel, each having upper and lower extremities;

(c) a first port and a second port associated with each chamber, both located in one of said extremities;

(d) each of said chambers containing a plurality of side-by-side annular-form vertically aligned catalyst-retaining sections positioned therein;

(e) each of said catalyst-retaining sections being defined by

an inner tubular-form catalyst-retaining screen coaxially disposed within an outer vertically positioned tubular-form catalyst-retaining screen, said inner catalyst-retaining screen further defining a fluid flow conduit within the inner space thereof;

(f) each of said chambers containing a first flow manifold connecting said first port to one extremity of each of said fluid flow conduits;

(g) each of said catalyst-retaining sections being further defined by two transverse partitions, one connected to the upper extremity of said fluid flow conduit and to the upper perimeter of said outer catalyst-retaining screen, and the other connected to the lower extremity of said fluid flow conduit and to the lower perimeter of said outer catalyst-retaining screen;

(h) each of said chambers having a void space in open communication with said second port, and defined by the inner walls of said chamber and the outer surface of the plurality of catalyst-retaining sections contained therein, said void space serving as a second flow manifold connecting the outer surface of said plurality of catalyst-retaining sections to said second port;

(i) catalyst inlet conduits extending through the upper extremity of the uppermost chamber and connected in open communication with the upper extremity of each of the catalyst-retaining sections contained therein;

(j) inter-chamber catalyst conduits connecting the lower extremity of each catalyst-retaining section in each reaction chamber, except the catalyst-retaining sections in the lowermost chamber, in open communication with the upper extremity of a catalyst-retaining section in the next lower chamber; and,

(k) catalyst withdrawal conduits connected in open communication with the lower extremity of each of the catalyst-retaining sections contained in the lowermost chamber and extending through the lower extremity thereof, whereby catalyst particles are gravitated through said vertically spaced reaction chambers via the plurality of catalyst-retaining sections contained therein.

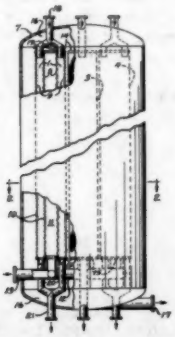
4,411,870
REACTOR SYSTEM

Joseph A. Kroushl, Westchester, and Arthur R. Greenwood, Niles, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 334,503, Dec. 28, 1981. This application Feb. 28, 1983, Ser. No. 470,429

Int. Cl.³ B01J *8/12*

U.S. Cl. 422—188 **20 Claims**



1. A reactor system comprising, in combination:

(a) a vertically elongated confined reaction chamber having upper and lower extremities;

(b) a first port and a second port associated with the chamber, both located in one of said extremities;

(c) said chamber containing a plurality of side-by-side annular-form vertically aligned catalyst-retaining sections positioned therein;

(d) each of said catalyst-retaining sections being defined by an inner tubular-form catalyst-retaining screen coaxially disposed within an outer vertically positioned tubular-form catalyst-retaining screen, said inner catalyst-retaining screen further defining a fluid flow conduit within the inner space thereof;

(e) said chamber containing a first flow manifold connecting said first port to one extremity of each of said fluid flow conduits;

(f) each of said catalyst-retaining sections being further defined by two transverse partitions, one connected to the upper extremity of said fluid flow conduit and to the upper perimeter of said outer catalyst-retaining screen, and the other connected to the lower extremity of said fluid flow conduit and to the lower perimeter of said outer catalyst-retaining screen; and,

(g) said chamber having a void space in open communication with said second port, and defined by the inner walls of the chamber and the outer surface of the plurality of catalyst-retaining sections contained therein, said void space serving as a second flow manifold connecting the outer surface of the plurality of catalyst-retaining sections to the second port.

11. A process for the conversion of a hydrocarbon charge stock characterized in that the hydrocarbon charge stock is passed in vapor phase to a reactor system comprising, in combination:

(a) a vertically elongated confined reaction chamber having upper and lower extremities;

(b) a first port and a second port associated with the chamber, both located in one of said extremities;

(c) said chamber containing a plurality of side-by-side annular-form vertically aligned catalyst-retaining sections positioned therein;

(d) each of said catalyst-retaining sections being defined by an inner tubular-form catalyst-retaining screen coaxially disposed within an outer vertically positioned tubular-form catalyst-retaining screen, said inner catalyst-retaining screen further defining a fluid flow conduit the inner space thereof;

(e) said chamber containing a first flow manifold connecting said first port to one extremity of each of said fluid flow conduits;

(f) each of said catalyst-retaining sections being further defined by two transverse partitions, one connected to the upper extremity of said fluid flow conduit and to the upper perimeter of said outer catalyst-retaining screen, and the other connected to the lower extremity of said fluid flow conduit and to the lower perimeter of said outer catalyst-retaining screen; and,

(g) said chamber having a void space in open communication with said second port, and defined by the inner walls of the chamber and the outer surface of the plurality of catalyst-retaining sections contained therein, said void space serving as a second flow manifold connecting the outer surface of the plurality of catalyst-retaining sections to the second port.

4,411,871
APPARATUS FOR CONVERTING COAL

Arthur F. Gulbrandsen, Claremore, and Uriel M. Oko, Tulsa, both of Okla., assignors to Cities Service Company, Tulsa, Okla.

Filed Oct. 19, 1981, Ser. No. 313,044

Int. Cl.³ B01J *8/08*

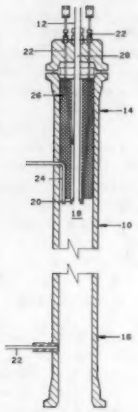
U.S. Cl. 422—232 **8 Claims**

1. A reactor for the rapid heating of carbonaceous materials and hydrogen and the subsequent reaction thereof, comprising:

(a) a generally cylindrical reactor shell including a distal bottom, a proximal top, and a longitudinal axis;

(b) a first inlet conduit extending through the proximal top,

and having a longitudinal axis which is common to the longitudinal axis of said reactor and having an inlet end terminating on the outside of said reactor shell and a discharge end terminating on the inside of said reactor shell, said discharge end of said first inlet conduit including a metallic covering that is relatively inert to carbon, resists forming a metal carbide with carbonaceous materials flowing through the first inlet conduit and resists adhesion of cracked carbonaceous materials flowing through the same;



(c) a second inlet conduit having an inlet end terminating on the outside of said reactor shell and a discharge end terminating on the inside of said reactor shell in proximity to said discharge end of said first inlet conduit;

(d) insulation means circumscribing said first inlet conduit on the inside of said reactor shell and lodging between the first inlet conduit and the second inlet conduit such that said insulation extends substantially to the discharge ends of said first and second conduits.

4,411,872

WATER UNIT FOR USE WITH A MEMBRANE BLOOD OXYGENATOR

Mogens L. Bramson, 35-21st Ave., San Francisco, Calif. 94121

Division of Ser. No. 774,675, Mar. 7, 1977, Pat. No. 4,168,293, and Ser. No. 42,923, May 29, 1979, Pat. No. 4,308,230. This application Dec. 16, 1981, Ser. No. 331,204

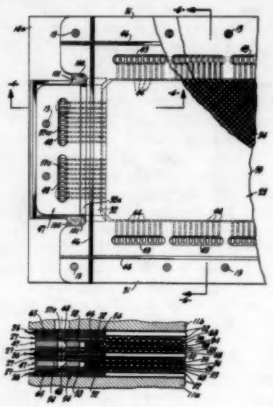
Int. Cl.³ A61M *1/03*

U.S. Cl. 422—310 **7 Claims**

1. A water unit suitable for use in a blood oxygenator of the membrane type, said water unit comprising an envelope of generally rectangular configuration having opposing sides and opposing ends and formed of flexible, water- and gas-impermeable material,

an insert at each end and within the envelope, at least one of said inserts being formed with water flow-through passage means and with lateral passage means for flow of water through the inserts and for flow of a portion of the water into, through and out of the envelope,

at least one said inserts being also formed with oxygen flow-through passage means which is so configured that it is isolated from the interior of said envelope and permits



flow of oxygen through the water unit without access to the interior of the envelope.

4,411,873

IN-LINE REGENERATION OF POLYTHIONATE POISONED ION EXCHANGE RESINS

Tsoung-Yuan Yan, Philadelphia, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 221,554, Dec. 31, 1980, abandoned. This application Jun. 4, 1981, Ser. No. 270,302

Int. Cl.³ C01G *43/00*

U.S. Cl. 423—7 **3 Claims**

1. In a process for recovering uranium values from a uranium-containing ore which also contains sulfides comprising leaching said ore to form uranyl complexes and by-product polythionates, passing the leachate over an anion exchange resin, and eluting uranium from said resin, the improvement comprising

adding sulfite directly to said leachate or eluant before being passed over said resin.

4,411,874

DETOXIFICATION OF SPENT ANTIMONY HALIDE CATALYST AND RECOVERY OF ANTIMONY VALUES

Sung K. Lee, East Amherst, N.Y., assignor to SCA Services, Inc., Boston, Mass.

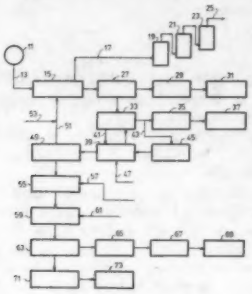
Filed Apr. 29, 1982, Ser. No. 372,996

Int. Cl.³ C01B *29/00*

U.S. Cl. 423—87 **27 Claims**

19. A process for hydrolyzing to an insoluble antimony

compound an antimony halide which is in a non-aqueous medium containing hydrogen fluoride, by treating the antimony



halide, in non-aqueous medium containing hydrogen fluoride, with an aqueous solution of calcium chloride.

4,411,875

DUAL ALKALI PROCESS FOR COMBUSTION GAS CLEANING

Robert S. Butler; Paul F. Claerbout, both of Effingham; Louis P. Kent, Mattoon; Randy S. Cleland, Hillsboro, all of Ill.; James H. Wilhelm, Sandy, Utah, and Richard E. Micko, Spokane, Wash., assignors to Central Illinois Public Service Company, Springfield, Ill.

Filed Mar. 25, 1982, Ser. No. 362,173

Int. Cl.³ C01B *17/00*

U.S. Cl. 423—242 **6 Claims**

1. A process for removing sulfur oxides from a sulfur oxides-containing gas stream, said process including contacting said gas stream with an aqueous alkali-metal sulfite solution reactable with said sulfur oxides thereby forming an alkali-metal bisulfite solution, contacting said alkali-metal bisulfite solution with an alkaline-earth metal hydroxide solution reactable with said alkali-metal bisulfite solution thereby reacting at least a portion of said alkali-metal bisulfite solution and forming a reaction solution including a plurality of forming precipitate crystals, said precipitate crystals including an alkaline-earth metal sulfite, said process comprising: maintaining said reaction solution at a pH of between about 11 and 13.5; and effectively agitating said reaction solution with an impeller having a tip speed between about 5 to about 15 feet per second for causing said precipitate crystals to grow to a crystal size from about 20 to about 40 microns for facilitating dewatering of said crystals.

4,411,876

PROCESS FOR THE MANUFACTURE OF TRIMAGNESIUM PHOSPHATE OCTAHYDRATE OF HIGH PURITY

Fawzy G. Sherif, Stony Point, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 30, 1982, Ser. No. 454,395

Int. Cl.³ C01B *25/26*

U.S. Cl. 423—311 **9 Claims**

1. A process for producing trimagnesium phosphate octahydrate having perfect crystal shapes, comprising adding a monobasic monomagnesium phosphate solution to a magnesium hydroxide slurry at a temperature of from about 35° C. to about 70° C. while maintaining the pH at from about 6.7 to about 6.9.

4,411,877

SYNTHESIS PROCESSES

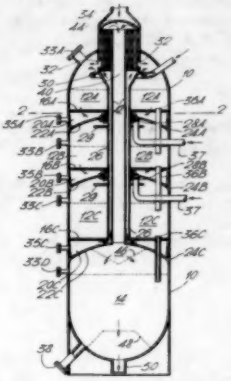
Alan Notman, Stockton-on-Tees, England, assignor to Imperial Chemical Industries PLC, London, England

Division of Ser. No. 185,440, Sep. 9, 1980, Pat. No. 4,311,671. This application Aug. 14, 1981, Ser. No. 293,014

Claims priority, application United Kingdom, Sep. 14, 1979, 7931877

Int. Cl.³ C01C *1/04*

U.S. Cl. 423—359 **7 Claims**



2. A process of methanol synthesis utilizing a reactor, comprising the steps of:

reacting carbon oxides with hydrogen over a catalyst in the reactor at a pressure and range of 30–100 bars absolute, and a temperature and range of 160°–300° C.;

controlling the temperature by practicing said reacting step over a copper-containing catalyst in at least one catalyst bed in the reactor, the bed in the form exteriorly of a cylinder having a vertical axis and a height not greater than its overall diameter, the bed being defined on its underside by a substantially flat grid supported by a dished plate having peripheral mechanical connection to a downward extension of the cylinder walls, the disked plate being convex upwards, and the cylinder being part of the external shell of the reactor; and

producing an output from the reactor of at least about 1500 metric tons of methanol per day.

3. A process of ammonia synthesis utilizing a reactor, comprising the steps of:

reacting nitrogen and hydrogen in the reactor at a pressure in the range of 30–120 bars absolute and a temperature in the range of 350°–450° C.;

controlling the temperature while practicing said reacting step by reacting nitrogen with hydrogen in the reactor over at least one catalyst bed in the form exteriorly of a cylinder having a vertical axis and a height not greater than its overall diameter, the bed being defined on its underside by a substantially flat grid supported by a dished plate having peripheral mechanical connection to a downward extension of the cylinder walls, the disked plate being convex upwards, and the cylinder comprising a part of an internal shell separated from an external pressure-resisting shell of the reactor by a space;

circulating a relatively cold gas in the space between the reactor external pressure-resisting shell and internal shell; and

producing an ammonia output from said reactor of at least about 1500 metric tons per day.

4,411,878

PREPARATION OF MN_3O_4

Jay Y. Welsh, Catonsville, Md., assignor to Chemetals Incorporated, Glen Burnie, Md.

Filed Sep. 30, 1982, Ser. No. 430,525
Int. Cl.³ C01G 45/02
U.S. Cl. 423—605 9 Claims

1. A process of perparing Mn_3O_4 from a higher manganese oxide, comprising the steps of:

immersing a higher manganese oxide in a flow of a reducing gas containing methane,

heating said higher manganese oxide in said flowing reducing gas containing methane to a temperature from about 250° C. to about 550° C., and

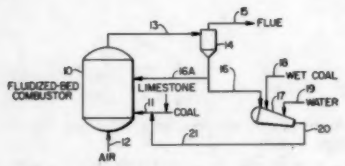
recovering Mn_3O_4.

4,411,879

METHOD FOR ENHANCING THE SULFUR CAPTURE POTENTIAL OF LIME USING A FILTER MEANS IN THE FLUE GAS

Shelton Ehrlich, Palo Alto, and Callixtus Aulisio, El Granada, both of Calif., assignors to Electric Power Research Institute, Palo Alto, Calif.

Filed Aug. 13, 1981, Ser. No. 292,646
Int. Cl.³ C01F 11/02
U.S. Cl. 423—640 11 Claims



1. A method for improving the sulfur capture potential of lime in the fluidized bed combustion of coal and for improving the flow characteristics of the feed coal thereto comprising:

(a) introducing the gas from fluidized bed combustion of coal which contains particles comprising calcium oxide into a filtering means whereby said particles are collected;

(b) mixing said particles with wet coal at a temperature from about 200° F. to about 400° F., thereby drying said coal and hydrating said calcium oxide to form calcium hydroxide;

(c) introducing the mixture from step (b) into said fluidized bed combustor.

4. A method for improving the sulfur capture potential of lime in the fluidized bed combustion of coal and for improving the flow characteristics of the coal feed therefor comprising:

(a) contacting wet coal with gas from fluidized bed combustion of coal thereby drying said coal;

(b) conducting the moisture-containing gas resulting from step (a) into a filtering means whereby particles in said gas comprising calcium oxide are collected;

(c) exposing said collected particles to said moisture containing gas at a temperature from about 200° F. to 400° F., thereby hydrating said calcium oxide to form calcium hydroxide;

(d) introducing the particles from step (c) and the coal from step (a) into said fluidized bed combustor.

10. A method for improving the sulfur capture potential of lime in the fluidized bed combustion of coal comprising:

(a) introducing moisture-containing gas from fluidized bed combustion of coal which contains particles comprising calcium oxide into a filtering means whereby said particles are collected;

(b) retaining said collected particles on said filtering means at a temperature from about 200° F. to 400° F. for a period of time sufficient to substantially hydrate said calcium oxide to form calcium hydroxide;

(c) introducing the product from step (b) into said fluidized bed combustor.

4,411,880

PROCESS FOR DISPOSING OF CARBON FIBERS

Christopher B. Brogna, Maplewood, N.J., assignor to Celanese Corporation, New York, N.Y.

Filed May 17, 1982, Ser. No. 378,980
Int. Cl.³ D01F 11/10, 13/00
U.S. Cl. 423—659 6 Claims

1. A process for disposing of carbon fibers comprising subjecting said fibers to an aqueous solution of a metal hypohalogenite wherein the metal is selected from the group consisting of alkali metals, alkaline earth metals, and mixtures of the foregoing, at an elevated temperature for a period of time sufficient to substantially destroy the fibrous configuration of said fibers wherein the concentration of said metal hypohalogenite is provided in said solution in an amount sufficient to produce between about 3 and about 30 percent by weight active halogen based on the weight of the solution, wherein said aqueous solution is provided at a temperature between about 50° C. and about 150° C. and wherein said process is performed at a pressure of between about 1 atmosphere and about 6 atmospheres.

4,411,881

COMPOSITION AND METHOD FOR STABILIZING RADIOLABELED COMPOUNDS USING THIOCARBONYLATED DIETHYLENETRIAMINES

Nathan R. Tzodikov, Marshfield, Mass., assignor to New England Nuclear Corporation, Boston, Mass.

Filed Jul. 12, 1982, Ser. No. 397,501
Int. Cl.³ A61K 43/00, 49/00
U.S. Cl. 424—1.1 23 Claims

14. A method for stabilizing a radiolabeled compound said method comprising admixing with said compound a thiocarbonylated diethylenetriamine stabilizing agent.

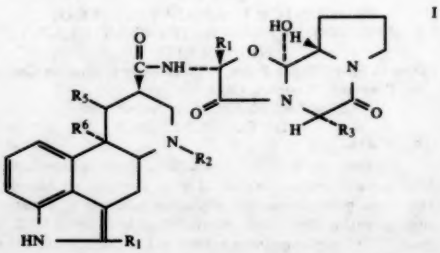
4,411,882

GALENICAL COMPOSITIONS

Joachim Franz, Riehen, Switzerland, and Ludwig Patt, Nuremberg, Fed. Rep. of Germany, assignors to Sandoz Ltd., Basel, Switzerland

Continuation-in-part of Ser. No. 105,831, Dec. 20, 1979, abandoned. This application Jun. 17, 1981, Ser. No. 274,603
Claims priority, application Switzerland, Dec. 21, 1978, 13019/78; Dec. 21, 1978, 13021/79; Jan. 19, 1979, 566/79; Jan. 19, 1979, 567/79; United Kingdom, Jun. 16, 1981, 8118491
Int. Cl.³ A61K 9/32, 9/36, 9/58, 9/62
U.S. Cl. 424—33 29 Claims

1. A solid eneric-coated composition in unit dosage form for oral application, the core of the composition containing a therapeutically effective amount of an ergot alkaloid compound of formula I,



wherein

R_1 is hydrogen or halogen,

R_2 is hydrogen or C_{1-4} alkyl,

R_3 is isopropyl, sec.-butyl, isobutyl or benzyl,

R_4 is methyl, ethyl or isopropyl, and

either

R_5 is hydrogen and

R_6 is hydrogen or methoxy

or R_5 and R_6 together are an additional bond

or mixtures thereof.

and a polyalkoxyalkylene sterol ether wherein the sterol part of the polyalkoxyalkylene sterol ether is chosen from the group consisting of lanosterol, dihydrochlolesterine, cholesterine and sitosterol, campesterol and stigmasterol, and wherein the enteric coating is selected from a cellulose ester derivative, a cellulose ether, an acrylic resin or a copolymer of maleic acid and phthalic acid derivatives.

4,411,883

ANTIPERSPIRANT

Divaker B. Kenkare, South Plainfield, and Durland K. Shumway, Piscataway, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 329,429, Feb. 5, 1973, abandoned. This application Jun. 6, 1975, Ser. No. 584,324

Int. Cl.³ A61K *7/34, 9/00*

U.S. Cl. 424—47 **10 Claims**

1. A dry anhydrous aerosol antiperspirant composition in a valved, normally closed pressurized dispensing container which comprises 0.2 to 12% by weight of an astringent powder comprising at least one astringent, antiperspirant acid-reacting salt of a member of the group cohaving a particle size of less than about 100microns 0.3 to 50% of Propylene-1,2-dipelargonate, and from about 60 to 98% of a non-toxic gas-forming liquid propellant.

4,411,884

COSMETIC AGENTS BASED ON POLYCATIONIC POLYMERS, AND THEIR USE IN COSMETIC COMPOSITIONS

Bernard Jacquet, Antony; Gérard Lang, Epinay-sur-Seine; Alain Malaval, Aulnay-sous-Bois; Serge Forestier, Claye Souilly, and Do Le Trung, Drancy, all of France, assignors to Societe Anonyme dite: L'Oreal, Paris, France

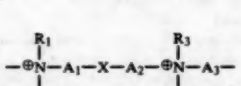
Filed Dec. 17, 1980, Ser. No. 217,411

Claims priority, application France, Dec. 21, 1979, 79 31431

Int. Cl.³ A61K *7/06, 7/09, 7/11*

U.S. Cl. 424—47 **39 Claims**

1. A hair-shaping cosmetic composition comprising a solution in an aqueous, alcoholic or hydroalcoholic carrier of a hair-shaping amount of a quaternized polymer containing units of the formula

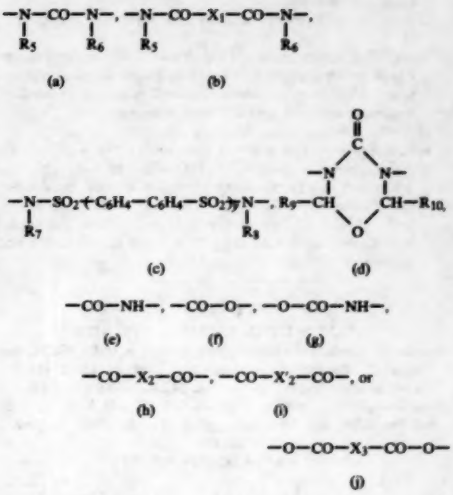


wherein

R_1, R_2, R_3 and R_4 each independently represent a hydrocarbon group, or at least one of the pairs R_1, R_2 and R_3, R_4 represent together with the nitrogen atom to which it is attached a heterocycle optionally containing an oxygen or sulfur heteroatom;

A_1 and A_2, each independently, represent linear or branched alkylene or arylene, substituted or not, containing up to 20 carbon atoms;

X represents a bivalent group of the formula



(a) (b) (c) (d) (e) (f) (g) (h) (i) (j)

wherein

y is equal to 0 or 1,

R_5, R_6, R_7, R_8, R_9 and R_{10} represent hydrogen or lower alkyl,

X_1 represents alkylene, alkylene including an —S—S— group, alkenylene, arylene, diaminoalkylene, diaminoarylene, dioxyyalkylene, dioxyarylene or polyoxyalkylene, or X_1 represents a direct covalent bond,

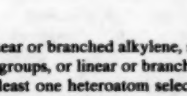
X_2 represents diaminoalkylene, dioxylkylene or polyoxyalkylene bivalent group,

X_2' represents dithioalkylene,

X_3 represents alkylene, cycloalkylene, arylene, diaminoalkylene, diaminocycloalkylene or diaminoarylene,

A_3 represents $—B_1—Y—B_2—$, wherein B_1 and B_2 represent alkylene or arylene and Y has the same meaning as X above, or

Y represents



or

A_3 represents linear or branched alkylene, substituted by one or more =O groups, or linear or branched alkylene interrupted by at least one heteroatom selected from oxygen, sulfur or nitrogen, or arylene, or

A_3 represents

$$—B_3—Y_1—B_4$$

wherein B_3 and B_4 represent arylene and Y_1 represents linear or branched alkylene, or linear or branched alkylene substituted by at least one —OH or =O group, or Y_1 represents a heteroatom selected from oxygen, sulfur or nitrogen, or

A_3 represents

(a) $—E—O—D)_{z'}O—E—$ or

(b) $—E—O—G—O—E—$, wherein

z' is a number ranging from 2 to 600,

E represents alkylene having 1-4 carbon atoms or $—CH_2—CHOH—CH_2—$,

D represents a bivalent hydrocarbon group containing 1–5 carbon atoms, and

G represents alkylene, cycloalkylene, arylene or aralkylene, or

when X is other than —CO—X_2—CO—, A_3 represents linear or branched alkylene or hydroxyalkylene, alkenylene or hydroxyalkenylene, cycloalkylene, or cycloalkenylene, containing up to 20 carbon atoms;

and $z^{\ominus}$ represents a halide anion;

with the proviso that when X represents —NH—CO—NH, A_3 represents —E—$(O—D)_2$—O—E— or —B_1—Y—B_2, wherein Y has the meaning given for X above except for the value —NH—CO—NH, or A_3 represents —E—O—G—O—E— wherein E and G have the meanings given above with the proviso that E and G are not simultaneously alkylene.

4,411,885

VITAMIN E OIL BASED DENTIFRICE

Ronald R. Barels, 1755 Kennington, Leucadia, Calif. 92024, and Daniel J. Ghinazzi, 1374 Mossy Ct., Concord, Calif. 94521

Continuation-in-part of Ser. No. 242,129, Mar. 9, 1981, abandoned, which is a division of Ser. No. 192,465, Sep. 30, 1980, Pat. No. 4,292,304. This application Mar. 22, 1982, Ser. No. 360,140

Int. Cl.³ A61K *7/18, 31/355*

U.S. Cl. 424—52 **11 Claims**

1. A vitamin E oil based dentifrice composition formed as an edible tablet adapted to be placed in a user's mouth and readily crushed, said tablet having

an abrasive agent in an amount of from about 3 weight percent to about 35 weight percent with respect to said tablet,

a quantity of vitamin E, said plurality of vitamin E in an amount of about 10 weight percent to about 85 weight percent with respect to said tablet,

a surfactant agent in a sufficient amount of said tablet to provide sudsing when said tablet is crushed and then agitated in the presence of an aqueous solution, and,

at least one excipient component.

4,411,886

STABILIZED COSMETIC COMPOSITIONS

Hans U. Hostettler, Arlesheim, and Horst Beyer, Basel, both of Switzerland, assignors to Richardson-Vicks Inc., Wilton, Conn.

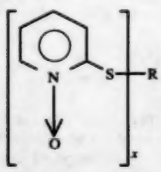
Continuation of Ser. No. 965,003, Nov. 30, 1978, abandoned. This application Feb. 11, 1980, Ser. No. 120,208

Claims priority, application Switzerland, Dec. 9, 1977, 1511277

Int. Cl.³ A61K *7/06, 31/44, 31/00*

U.S. Cl. 424—70 **10 Claims**

1. A cosmetic preparation containing, as an active ingredient, an effective amount of a compound represented by the formula



wherein R is sodium, potassium or ammonium and x is 1 or R is aluminum and x is 3 said preparation containing an amount of N-acetylcysteine sufficient to stabilize said compound against photochemical oxidation or decomposition, said N-acetylcysteine being present in from about 0.5 to about 8 times the amount of said compound.

4,411,887

USE OF ALKYLENE OXIDE COPOLYMERS AS EMOLLIENTS IN COSMETIC PREPARATIONS

Karl Seibert, Duren; Heinz Praetorius, Lendersdorf, and Gunter Poppel, Duren-Niederau, all of Fed. Rep. of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Continuation of Ser. No. 37,980, May 11, 1979, abandoned. This application Aug. 27, 1981, Ser. No. 296,688

Claims priority, application Fed. Rep. of Germany, May 18, 1978, 2821654

Int. Cl.³ A61K *31/74*

U.S. Cl. 424—78 **16 Claims**

1. A skin contacting composition which is a water-in-oil emulsion comprising, in addition to an active ingredient or decorative cosmetic material, an emollient which is a copolymer of short-chain alkylene oxide selected from the group consisting of ethylene oxide, propylene oxide and a mixture of ethylene oxide and propylene oxide with a long-chain alkylene oxide containing 6 to about 30 carbon atoms, said copolymer containing a weight ratio of short-chain alkylene oxide moieties to long-chain alkylene oxide moieties in the copolymer of about 5:95 to about 70:30.

4,411,888

COMPOSITION OF A NOVEL IMMUNOGEN FOR PROTECTION AGAINST DIARRHEAL DISEASE CAUSED BY ENTEROTOXIGENIC *ESCHERICHIA COLI*

Frederick A. Klipstein, Rochester; Richard E. Engert, Webster, and John D. Clements, Pittsford, all of N.Y., assignors to The University of Rochester, Rochester, N.Y.

PCT No. PCT/US82/00763, § 371 Date Jun. 3, 1982, § 102(e) Date Jun. 3, 1982, PCT Pub. No. WO83/00018, PCT Pub. Date Jan. 6, 1983

Continuation-in-part of Ser. No. 276,409, Jun. 22, 1981, abandoned. This PCT application Jun. 3, 1982, Ser. No. 403,751

Int. Cl.³ A61K *39/108, 39/106*

U.S. Cl. 424—92 **18 Claims**

1. A composition for immunization of mammals against diarrheal disease comprising the product provided by the process which comprises reacting heat-stable (ST) enterotoxin of *Escherichia coli* with a reactant selected from the group consisting of heat-labile (LT) enterotoxin of *Escherichia coli*, the B subunit of said heat labile (LT) enterotoxin, cholera toxin (CT) holotoxin of *Vibrio cholerae*, and the B subunit of said cholera toxin (CT) holotoxin at a molar ratio of ST to reactant of at least 1 to 1 in the presence of a conjugating reagent.

4,411,889

SELF-GELLING LIQUID COMPOSITION FOR TOPICAL APPLICATION IN THE ORAL CAVITY

Vera B. Caslavsky, Lexington; Poul Gron, Needham, both of Mass., and Howard Fine, Montreal, Canada, assignors to Forsyth Dental Infirmary for Children, Boston, Mass.

Filed May 24, 1982, Ser. No. 381,530

Int. Cl.³ A61K *7/18, 33/16*

U.S. Cl. 424—151 **25 Claims**

1. A fluoride-containing, self-gelling aqueous composition for topical application on tooth surfaces in the oral cavity for the prevention of dental caries, which composition comprises in combination:

(a) a low-viscosity, liquid, aqueous solution of a monomer or prepolymer ethyl orthosilicate in an amount to provide for the conversion of the liquid to a gel state;

(b) a water-soluble fluoride compound in an amount to inhibit or prevent dental caries on topical application of the composition; and

(c) a gelation agent in an amount to provide in situ self-gelation of the composition from a low-viscosity liquid composition to a gel state, on topical application of the liquid composition onto the surface of the teeth in a patient, the gelation from a liquid to a gel state occurring in a time

period of about 1 hour or less after mixing by hydrolysis of the silicate.

4,411,890

SYNTHETIC PEPTIDES HAVING PITUITARY GROWTH HORMONE RELEASING ACTIVITY

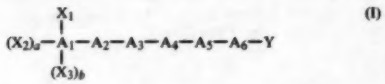
Frank A. Momany, Memphis, Tenn., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Continuation-in-part of Ser. No. 254,035, Apr. 14, 1981, abandoned, which is a continuation of Ser. No. 165,163, Jul. 1, 1980, abandoned, which is a continuation-in-part of Ser. No. 85,824, Oct. 17, 1970, abandoned. This application Dec. 28, 1981, Ser. No. 335,011

Int. Cl.³ A61K *37/00;* **C07C** *103/52*

U.S. Cl. 424—177 **48 Claims**

1. A peptide having a formula



(I)

wherein

X_1, X_2, and X_3 are selected from a group consisting of —R, —OR, RC(O)— wherein R is selected from a group consisting of hydrogen and straight chain and branched chain alkyl groups containing 1–6 carbon atoms;

a and b are 0 or 1, provided that a and b are 0 when A_1 is a desamino residue;

A_1 and A_4 are selected from a group consisting of His, Arg, Lys, α-Naphth, β-Naphth, IQl, Tyr, Trp, Phe, homologues and analogues thereof, and, with respect to A_1, the desamino forms thereof;

A_2 and A_5 are selected from a group consisting of D-His, D-Arg, D-Lys, D-α-Naphth, D-β-Naphth, D-Iql, D-Tyr, D-Trp, D-Phe, and homologues and analogues thereof;

A_3 is selected from a group consisting of Gly, Ala, Val, Leu, Ile, Pro, Ser, Thr, Met, Asp, Glu, Asn, Gln, His, D-Ala, D-Val, D-Leu, D-Ile, D-Pro, D-Ser, D-Thr, D-Met, D-Asp, D-Glu, D-Asn, D-Gln, D-His, and homologues and analogues thereof;

A_6 is selected from a group consisting of amino acids of the L- and D-configuration, homologues and analogues thereof, and the descarboxy forms thereof; and

Y is selected from a group consisting of C-terminal and descarboxy alpha-carbon substitutions;

and the pharmaceutically acceptable salts thereof.

4,411,891

CATIONIZED DEXTRAN AND SALTS THEREOF AND MANUFACTURING PROCESS AND UTILIZATION THEREOF

Akihiro Mizutani, Nagoya, and Kimio Hirose, Gifu, both of Japan, assignors to Meito Sangyo Kabushiki Kaisha, Aichi, Japan

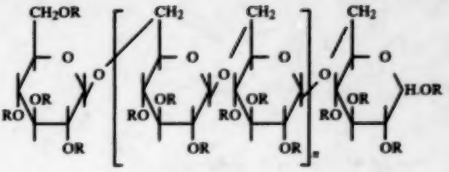
Filed Jun. 16, 1981, Ser. No. 274,067

Claims priority, application Japan, Jun. 16, 1980, 55-80280; Oct. 20, 1980, 55-145714

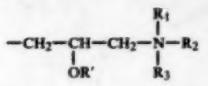
Int. Cl.³ A61K *31/70, 31/715;* **C08B** *37/02*

U.S. Cl. 424—180 **8 Claims**

6. A hair or skin cosmetic composition comprising (1) a hair or skin cosmetic base and (2) a cationized dextran of the formula



wherein R represents a group selected from the class consisting of a hydrogen atom, hydroxy lower alkyl groups, and quaternary nitrogen-containing groups of the formula



in which R_1, R_2 and R_3 each represent a lower alkyl group, and R′ represents a hydrogen atom or a hydroxy lower alkyl group, and n is a positive number of from 1 to 8,000; two or more R groups may be identical or different provided that at least one of R groups is the quaternary nitrogen-containing group of the above formula;

or its salt acceptable for hair or skin cosmetics.

4,411,892

TYLOSIN MACROLIDE ANTIBIOTICS FROM STREPTOMYCES

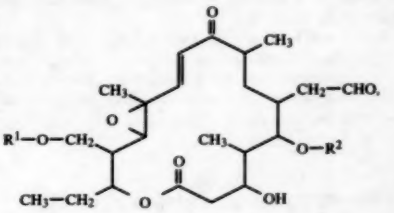
Walter D. Celmer, New London; Walter P. Cullen, East Lyme, both of Conn.; Riichiro Shibakawa, Handa, and Junsuke Tone, Chita, both of Japan, assignors to Pfizer Inc., New York, N.Y.

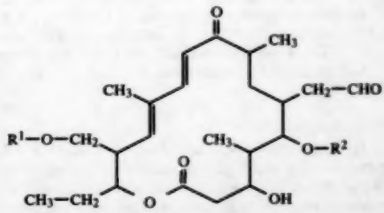
Filed May 3, 1982, Ser. No. 374,223

Int. Cl.³ A61K *31/71;* **C07H** *17/08;* **C12P** *19/62*

U.S. Cl. 424—181 **5 Claims**

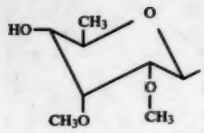
1. A compound selected from the group consisting of:



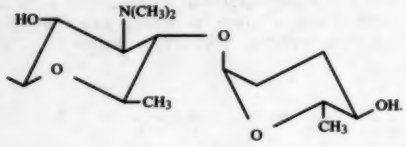


and the pharmaceutically-acceptable acid addition salts thereof;

wherein R^1 is the group of the formula



and R^2 is the group of the formula



4. A method of treating a bacterial infection in a mammalian subject, which comprises administering to said subject an antibacterially effective amount of a compound according to claim 1.

4,411,893

TOPICAL MEDICAMENT PREPARATIONS

Dee L. Johnson, Woodbury; Therese A. Senta, Minneapolis, and Larry M. Sirvio, Cottage Grove, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 292,809, Aug. 14, 1981, abandoned, which is a continuation of Ser. No. 187,089, Sep. 15, 1980, abandoned. This application Sep. 24, 1982, Ser. No. 422,891

Int. Cl.³ A61K *31/71, 31/13*

U.S. Cl. 424—181 8 Claims

1. A composition for topical application to animal skin comprising:

(1) an effective amount of a therapeutic agent selected from the group consisting of erythromycin, benzoyl peroxide, hydrocortisone, tetracycline, 5-fluorouracil, and propranolol;

(2) about 0.1 to 70 percent by weight of a water-soluble tertiary amine oxide; and

(3) at least 1 molecule of water for every molecule of said amine oxide; said composition exhibiting at least 50 percent greater penetration of said therapeutic agent through mouse skin in 24 hours than a control composition without said amine oxide.

4,411,894

PHARMACEUTICAL PREPARATIONS

Jürg Schrank, Riehen, and Hans Steffen, Arisdorf, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation of Ser. No. 159,441, Jun. 13, 1980, abandoned. This application Aug. 17, 1981, Ser. No. 293,587

Claims priority, application Switzerland, Jun. 22, 1979, 5863/79

Int. Cl.³ A61K *31/33, 31/685*

U.S. Cl. 424—199 8 Claims

1. A pharmaceutical composition suitable for parenteral administration of fat-soluble pharmaceutically-active materials which comprises pharmaceutical adjuvants, a fat-soluble pharmaceutically-active material selected from the group consisting of a benzodiazepine or quinolinemethanol derivative, a lecithin of vegetable or animal origin and a sugar component selected from the group consisting of monosaccharides and disaccharides.

4,411,895

METHOD FOR CONTROLLING BLUETONGUE DISEASE IN SHEEP

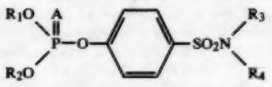
William G. Anderson, Rte. 1, Box 350, Ontario, Oreg. 97914

Filed Mar. 31, 1982, Ser. No. 363,828

Int. Cl.³ A61K *31/66*

U.S. Cl. 424—211 3 Claims

1. A method for preventing the transmission of bluetongue virus to sheep from the Culicoides gnat which comprises administering to the animal a chemotherapeutic dosage of a compound of the formula:



wherein R_1 and R_2 are lower alkyl of from 1 to 4 carbon atoms, A is a member of the group consisting of oxygen and sulfur atoms, and R_3 and R_4 are members of the group consisting of hydrogen and lower alkyl, which dosage is administered directly to the skin of the animal.

4,411,896

RIFAMYCINS, THEIR COMPOSITIONS AND USE AS ANTIBIOTICS

Thomas Schupp, Möhlin; Peter Traxler, Allschwil, and Jakob Nüesch, Arlesheim, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 270,184, Jun. 3, 1981, Pat. No. 4,376,166, which is a division of Ser. No. 112,898, Jan. 17, 1980, Pat. No. 4,298,692. This application Jul. 12, 1982, Ser. No. 397,379

Int. Cl.³ A61K *31/395;* C07D *491/08*

U.S. Cl. 424—244 5 Claims

5. A method for combating infectious bacterial diseases in warm-blooded animals by administration of an effective amount of 3-hydroxyrifamycin S, 3,31-dihydroxyrifamycin S, 1-desoxy-1-oxarifamycin S, singly or together in any combination, alone or in the form of a pharmaceutical preparation.

4,411,897

CRYSTALLINE SALTS

Riccardo Scartazzini, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 15, 1981, Ser. No. 225,295

Claims priority, application Switzerland, Feb. 1, 1980, 836/80

Int. Cl.³ A61K *31/545;* C07D *501/20*

U.S. Cl. 424—246 6 Claims

1. Crystalline 7β-[2-(2-amino-4-thiazolyl)-2-methoxyiminoacetamido]-3-cephem-4-carboxylic acid pivaloyloxymethyl ester hydrochloride in syn-form.

2. Crystalline 7β-[2-(2-amino-4-thiazolyl)-2-methoxyiminoacetamido]-3-cephem-4-carboxylic acid pivaloyloxymethyl ester hydrobromide in syn-form.

4,411,898
7-[2-OXYIMINO-2-(2-AMINOTHIAZOL-4-YL)ACETAMIDO]-3-(1-CARBOXYALKYL-1H-TETRAZOL-5-YL)THIOMETHYL-3-CEPHEM-4-CARBOXYLIC ACID COMPOUNDS

Takao Takaya, Kawanishi, and Masayoshi Murata, Mino, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

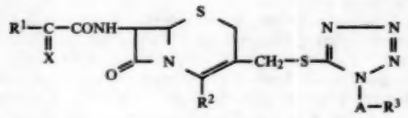
Division of Ser. No. 79,796, Sep. 28, 1979, Pat. No. 4,288,436, which is a continuation-in-part of Ser. No. 891,289, Mar. 29, 1978, abandoned. This application Apr. 29, 1981, Ser. No. 258,612

Claims priority, application Japan, Apr. 13, 1977, 15378/77; United Kingdom, Jan. 23, 1978, 2650/78

Int. Cl.³ A61K *31/545*

U.S. Cl. 424—246 **16 Claims**

1. 3-7-Disubstituted-3-cephem-4-carboxylic compounds of the formula:



wherein

R^1 is thiazol-4-yl having an amino or a protected amino at 2 position;

R^2 and R^3 are each carboxy or protected carboxy;

X is isopropoxyimino, lower alkenyloxyimino, cyclo(lower-)alkoxyimino, phenyl(lower)alkoxyimino or lower alkyl-phenyl(lower)alkoxyimino; and

A is lower alkylene; and,

pharmaceutically acceptable salts thereof.

8. A pharmaceutical antibacterial composition comprising an effective amount of a compound of claim 1 in association with a pharmaceutically acceptable, substantially non-toxic carrier or excipient.

4,411,899
SUBSTITUTED DERIVATIVES OF AMINO ALKANE DIOLS AS GASTRIC SECRETION INHIBITORS

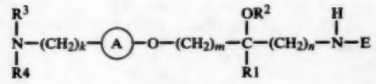
John J. Baldwin, Gwynedd Valley, and William C. Lumma, Jr., Pennsburg, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Dec. 21, 1981, Ser. No. 332,691

Int. Cl.³ C07D *285/10;* **A61K** *31/425, 31/535*

U.S. Cl. 424—246 **12 Claims**

1. A compound having the formula:



wherein

R^1 is hydrogen, loweralkyl;

R^2 is hydrogen, loweralkyl, benzyl, loweralkanoyl, loweralkyoxyloweralkyl, benzyloxyloweralkyl;

R^3 and R^4 are independently hydrogen, loweralkyl, cycloloweralkyl of C_3–C_8, cycloalkylalkyl of C_3–C_8, or R^3 and R^4 may be joined to form, together with the nitrogen to which they are attached, $-(CH_2)_rX(CH_2)_{r'}-$ wherein X can be O, S, CH_2, or NR^5 wherein R^5 is hydrogen, loweralkyl; loweralkanoyl;

r and r' are independently 1, 2, or 3 provided that when r or r' is 1, X is CH_2;

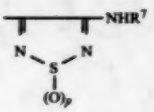
n is 1 or 2;

m is 1 or 2;

k is 0 to 4;

Ⓐ is a substituted phenylene wherein the substituent can be hydrogen, halo, cyano, loweralkoxy, loweralkyl;

E is



wherein

R^7 is hydrogen, loweralkyl, substituted loweralkyl wherein the substituent can be hydroxy, alkoxy; loweralkynyl; loweralkenyl or loweralkanoyl; aryl; substituted aryl wherein the substituent can be halo, loweralkoxy, loweralkyl; heteroaryl;

p is 1 or 2; and,

the physiologically acceptable, non-toxic salts thereof.

10. A method for suppressing gastric acid secretions in an animal with excess gastric acid secretions which comprises administering to said animal an effective antisecretory amount of a compound of claim 1.

4,411,900
BENZHYDRYLPIPEROZINYL THIAZOLE DERIVATIVES AND PHARMACEUTICAL COMPOSITION COMPRISING THE SAME

Ikuo Ueda, Toyonaka; Daizou Morino, Matsubara, and Koichi Takimoto, Osaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Dec. 11, 1980, Ser. No. 215,372

Claims priority, application United Kingdom, Jan. 3, 1980, 8000162

Int. Cl.³ C07D *295/02;* **A61K** *31/495*

U.S. Cl. 424—250 **18 Claims**

1. A compound selected from the group consisting of 2-acetamido-4-(4-benzhydrylpiperazin-1-ylmethyl)thiazole, 2-acetamido-4[2-(4-benzhydrylpiperazin-1-yl)ethyl]thiazole, 2-acetamino-4-[2-(4-(4-chlorobenzhydryl)-piperazin-1-yl)ethyl]-thiazole, 2-acetamido-4-[3-(4-benzyhydrylpiperazin-1-yl)-propyl]thiazole, 2-acetamido-5-[2-(4-benzhydrylpiperazin-1-yl)ethyl]-4-methylthiazole, 4-(4-benzhydrylpiperazin-1-ylmethyl)-2-[N-(N,N-dimethylamino)-methyleneamino]thiazole, 2-amino-4-[4-benzhydrylpiperazin-1-ylmethyl]thiazole, 2-amino-4-[3-(4-benzhydrylpiperazin-1-yl)propyl]thiazole, 4-[4-benzhydrylpiperazin-1-ylmethyl]-2-methanesulfonamido-thiazole, 4-(4-benzhydrylpiperazin-1-ylmethyl)-2-(N,N-dimesylamino)-thiazole, 4-(4-benzhydrylpiperazin-1-ylmethyl)-2-ethanesulfonamido-thiazole, 4-[4-benzhydrylpiperazin-1-ylmethyl]-2-propanesulfonamidothiazole, 4-[2-(4-benzhydrylpiperazin-1-yl)ethyl]-2-methanesulfonamido-thiazole, 4-[3-(4-benzhydrylpiperazin-1-yl)propyl]-2-methanesulfonamido-thiazole, and 4-[3-(4-benzhydrylpiperazin-1-yl)propyl]-2-ethanesulfonamido-thiazole, and pharmaceutically acceptable salts thereof.

4,411,901
BENZISOTHIAZOLE AND BENZISOXAZOLE PIPERAZINE DERIVATIVES

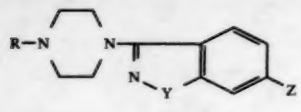
Davis L. Temple, Jr., Evansville, and Joseph P. Yevich, Newburgh, both of Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Filed Dec. 23, 1981, Ser. No. 333,830

Int. Cl.³ C07D *401/00, 413/00;* **A61K** *31/41*

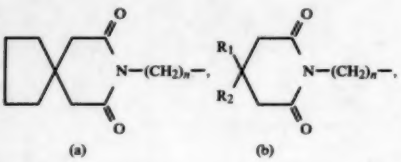
U.S. Cl. 424—250 **12 Claims**

1. A compound of Formula (I)



I

wherein R represents the radical



(a) (b)

wherein

n is 3 or 4,

R_1 and R_2 are independently lower alkyl of 1 to 4 carbon atoms,

Y is oxygen or sulfur,

Z is hydrogen or halogen

or a pharmaceutically acceptable non-toxic acid addition salt thereof.

4,411,902

SALTS OF ENDO-8-METHYL-8-SYN-ALKYL-8-AZONIABICYCLO-[3.2.1]-OCTANE-3-ALKYLCARBOXYLATES, AND THERAPEUTIC COMPOSITIONS CONTAINING THEM

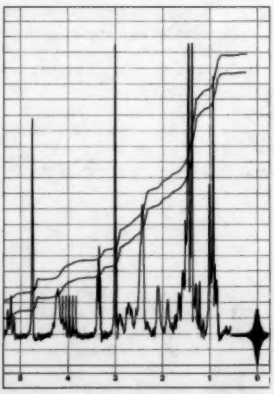
Virgilio Bernareggi, Cologno Monzese; Roberto Margutti, Milan; Fausto Bonifacio, Milan, and Maurizio Fano, Bresso, all of Italy, assignors to Valeas S.p.A., Milan, Italy

Filed Jun. 3, 1981, Ser. No. 270,008

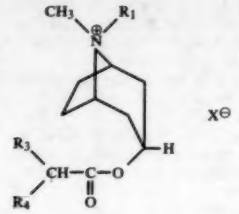
Claims priority, application Italy, Jun. 18, 1980, 22843 A/80

Int. Cl.³ C07D *451/10*; A61K *31/46*

U.S. Cl. 424—265 **5 Claims**



1. Endo-8-methyl-8-syn-alkyl-8-azoniabicyclo-[3.2.1]-octane-3-alkylcarboxylate salts of formula:



(1)

in which:

R_1 is a linear or branched alkyl radical of 2–5 C atoms, a cycloalkyl radical of 3–6 C atoms, or a benzyl radical

R_3 and R_4, which can be the same or different, are alkyl radicals of 1–6 C atoms

X is a halide ion.

5. A method of treating spasms comprising administering to a patient suffering from spasms a spasmolytically effective amount of a pharmaceutically acceptable acid addition salt of an endo-8-methyl-8-syn-alkyl-8-azoniabicyclo-(3.2.1)-octane-3-alkylcarboxylate, wherein the alkyl of 8-syn-alkyl is a linear or branched alkyl radical of 2–5 C atoms, a cycloalkyl radical of 3–6 C atoms, or a benzyl radical.

4,411,903

4-[(MONOSUBSTITUTED-ALKYL)AMINO]BENZOIC ACIDS AND ANALOGS AS HYPOLIPIDEMIC AND ANTIATHEROSCLEROTIC AGENTS

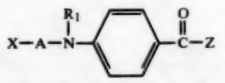
Robert G. Shepherd, Selbyville, Del., assignor to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 176,890, Aug. 11, 1980, Pat. No. 4,311,846, which is a division of Ser. No. 881,456, Feb. 27, 1978, Pat. No. 4,245,097. This application Oct. 22, 1981, Ser. No. 313,853

Int. Cl.³ A61K *31/445*, *31/40*

U.S. Cl. 424—267 **14 Claims**

1. The method of inhibiting atherosclerotic lesion development in a mammal comprising the administration of an effective lesion-development inhibiting amount of a compound of the formula:



I

wherein

X is selected from the group consisting of chloro, bromo, and iodo;

A is an unbranched or branched saturated alkylene group, represented by the formula C_nH_{2n} with n being an integer from 7 to 18 inclusive;

R_1 is hydrogen; and Z represents the atoms necessary to complete a pyrrolidino or piperidino radical;

and the pharmaceutically acceptable non-toxic acid-addition and cationic salts thereof to said mammal.

4,411,904
DIPHENYLPROPANAMINES, COMPOSITIONS THEREOF AND USE THEREOF

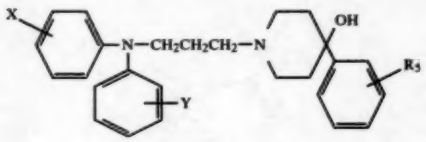
Ian C. Pattison, Ann Arbor, Mich., assignor to Warner-Lambert Company, Morris Plains, N.J.

Division of Ser. No. 268,502, May 29, 1981, Pat. No. 4,364,954, which is a division of Ser. No. 111,043, Jan. 10, 1980, Pat. No. 4,292,321, which is a continuation of Ser. No. 42,175, May 24, 1979, abandoned. This application Jun. 14, 1982, Ser. No. 388,343

Int. Cl.³ A61K *31/445;* C07D *211/52*

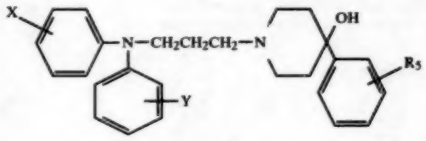
U.S. Cl. 424—267 5 Claims

1. A compound of the formula



wherein X and Y are independently hydrogen, halogen, lower alkyl, or nitro; R_5 is hydrogen, halogen, lower alkyl or trifluoromethyl; and the non-toxic, pharmaceutically acceptable salts thereof.

5. A method of treating schizophrenia in mammals comprising the administration of an effective amount of a compound having the formula:



wherein X and Y are independently hydrogen, halogen, lower alkyl, or nitro; R_5 is hydrogen, halogen, lower alkyl or trifluoromethyl; and the non-toxic, pharmaceutically acceptable salts thereof.

4,411,905
ANTISECRETORY 1,2,4-TRIAZOLE-3-THIOLS

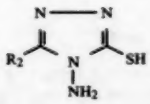
William L. Albrecht, and Winton D. Jones, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Cincinnati, Ohio

Continuation of Ser. No. 143,456, Apr. 24, 1980, abandoned, which is a division of Ser. No. 71,814, Sep. 4, 1979, Pat. No. 4,230,715. This application Jun. 15, 1981, Ser. No. 273,531

Int. Cl.³ A61K *31/41;* C07D *249/12*

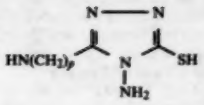
U.S. Cl. 424—269 2 Claims

1. A pharmaceutical composition comprising in unit dosage form about 5-300 mg. of a compound of the formula



wherein R_2 is $—CH_2OH$ or $—(CH_2)_pNH_2$; and p is 1–5, or a pharmaceutically acceptable acid addition salt thereof and a significant amount of a pharmaceutically acceptable carrier.

2. A compound having the formula



wherein p is 1–5; and the pharmaceutically acceptable acid addition salts thereof.

4,411,906
(5R,6S,8R)-6-(1-HYDROXYETHYL)-2-(2-FLUOROETHYLTHIO)-PENEM-3-CARBOXYLATES

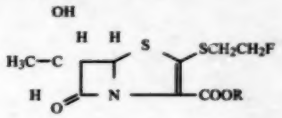
Vlyyoor M. Girijavallabhan, Parsippany; Stuart W. McCombie, West Orange, and Ashit K. Ganguly, Upper Montclair, all of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Filed Nov. 25, 1981, Ser. No. 324,931

Int. Cl.³ C07D *499/00;* A61K *31/425*

U.S. Cl. 424—270 21 Claims

1. A compound of the formula:



wherein R is a member of the group consisting of hydrogen, a pharmaceutically acceptable cation and a metabolisable ester group.

4,411,907
ANTIINFLAMMATORY 3H-NAPHTHO(1,2-D)IMIDAZOLES

Emilio Toia, Milan, Italy, assignor to Gruppo Lepetit, S.p.A., Milan, Italy

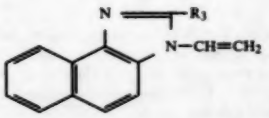
Filed May 22, 1981, Ser. No. 266,228

Claims priority, application Italy, Jun. 6, 1980, 22601 A/80

Int. Cl.³ A61K *31/415;* C07D *235/02, 235/18*

U.S. Cl. 424—273 B 4 Claims

1. A 3H-naphtho[1,2-]imidazole derivative having the formula



wherein R_3 represents a phenyl radical optionally substituted with 1 to 3 groups independently selected from (C_1–C_4) alkyl and (C_1–C_4) alkoxy; or a salt thereof with a pharmaceutically acceptable acid.

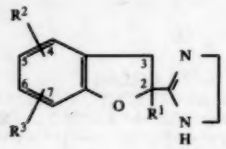
3. An antiinflammatory or analgesic composition in dosage unit form which comprises from about 50 to about 1000 mg of a compound of claim 1, or an acid addition salt thereof, in admixture with a pharmaceutical carrier.

4,411,908
IMIDAZOLINE DERIVATIVES AS PRESYNAPTIC α_2-ADRENORECEPTOR ANTAGONISTS

Christopher B. Chapleo, Swanland, and Peter L. Myers, Princes Risborough, both of England, assignors to Reckitt & Colman Products Limited, London, England

Filed Jul. 13, 1982, Ser. No. 397,686
Claims priority, application United Kingdom, Jul. 28, 1981, 8123271
Int. Cl.³ A61K *31/415*; C07D *405/04*
U.S. Cl. 424—273 R 13 Claims

1. A compound of the formula



(I)

wherein R^1 is hydrogen or alkyl C_{1-6}; R^2 is hydrogen, methyl, chloro, bromo or fluoro; R^3 is hydrogen, methyl, hydroxy, methoxy, fluoro, chloro or bromo; or a non-toxic salt thereof.

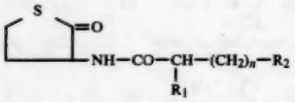
12. A method of treating depression which comprises administering to a human an antidepressant effective amount of a compound as claimed in claim 1 or a non-toxic salt thereof.

4,411,909
[(2-OXO-3-TETRAHYDROTHIENYLCARBAMOYL)-ALKYLTHIO] ACETIC ACIDS, THEIR SALTS AND ESTERS, A PROCESS FOR PREPARATION THEREOF AND THE PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

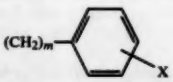
Jacques Gonella, Zollikon, Switzerland, assignor to Refarmed, Recherches Pharmaceutiques et Medicales, S.A., Switzerland

Filed Mar. 15, 1982, Ser. No. 358,370
Claims priority, application France, Mar. 19, 1981, 8105496
Int. Cl.³ A61K *31/38*; *C07D 333/16*
U.S. Cl. 424—275 8 Claims

1. [(2-oxo-3-tetrahydrothienylcarbamoyl)-alkylthio]-acetic acid, salt or ester, fof formula:



in which n represents 0 or 1 and one of the substituents R_1 and R_2 represents a hydrogen atom or a methyl group and the other represents a $—S—CH_2—COOR_3$ group, where R_3 is a hydrogen atom or an alkali metal or a group R_3', R_3' being a lower alkyl or a group:



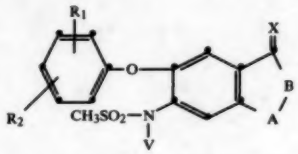
where m represents 0 or 1 and X represents a hydrogen atom, or a lower alkyl, lower alkoxy or nitro group.

4,411,910
BENZOFURAN DERIVATIVES AND THEIR PHARMACEUTICAL USE

Eberhard Schroeder, deceased, late of Berlin, Fed. Rep. of Germany (by Kirsten Schroeder, Christian Schroeder, legal representatives); Manfred Lehman, and Clemens Rufer, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Mar. 11, 1982, Ser. No. 357,344
Claims priority, application Fed. Rep. of Germany, Mar. 11, 1981, 3110009
Int. Cl.³ A61K *31/34, 31/365*; C07D *307/79, 307/88*
U.S. Cl. 424—279 18 Claims

1. A benzofuran derivative of the formula



wherein

V is hydrogen or acetyl,

X is oxo or two hydrogen atoms,

R_1 and R_2 each independently is hydrogen, fluorine, or chlorine, and

—A—B— is $—O—CH_2—$ or $—CH_2—O—$.

18. A method of treating inflammation in a mammal comprising administering an antiinflammatorily effective amount of a compound of claim 1 to the mammal.

4,411,911
METHOD OF TREATING HYPERLIPIDEMIA AND INFLAMMATION WITH SULFONATE DERIVATIVES

Setsuro Fujii, Tovonaka; Toshihiro Hamakawa, Naruto; Kazuo Ogawa, Tokushima; Yoshiyuki Muranaka, Tokushima, and Sadao Hashimoto, Tokushima, all of Japan, assignors to Taiho Pharmaceutical Company, Limited, Tokyo, Japan

Filed Jan. 19, 1981, Ser. No. 225,979
Claims priority, application Japan, Jan. 31, 1980, 55-11214; Jul. 11, 1980, 55-95299; Sep. 30, 1980, 55-137026; Dec. 19, 1980, 55-180852
Int. Cl.³ A61K *31/35, 31/34, 31/255*
U.S. Cl. 424—283 4 Claims

1. A method of treating a patient having hyperlipidemia, said method comprising administering to said patient a therapeutically effective amount of a compound of the formula

$$R_1SO_3CH_2CO(CH_2)_nR_2$$

wherein R_1 is alkyl having 1 to 4 carbon atoms, alkoxyalkyl having 2 to 6 carbon atoms, phenylalkyl, cycloalkyl or aryl (which is phenyl or naphthyl) with or without a substituent (which is alkyl having 1 to 12 carbon atoms, lower alkoxy, halogen, hydroxyl, carboxyl, acetamido, nitro or ethylenedioxymethyl), R_2 is alkyl having 1 to 15 carbon atoms, alkenyl having 2 to 15 carbon atoms, halogen, hydroxyl, lower alkoxy, lower alkoxycarbonyl, C_2 to C_6 acyloxy, carbobenzoxyamino, cycloalkyl having 3 to 6 carbon atoms, cyclic alkylether having 2 to 5 carbon atoms or cyclic alkenylether having 2 to 5 carbon atoms, or phenyl or naphthyl with or without lower alkyl substituent(s), and n is 0 or an integer of 1 to 6.

4,411,912
INSECTICIDAL ISOVALERIC ACID ESTERS

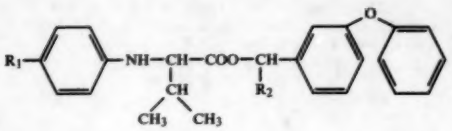
Clive A. Henrick, Palo Alto, and Barbara A. Garcia, Boulder Creek, both of Calif., assignors to Zoecon Corporation, Palo Alto, Calif.

Division of Ser. No. 878,091, Feb. 16, 1978, Pat. No. 4,243,819, which is a continuation-in-part of Ser. No. 824,947, Aug. 15, 1977, abandoned, which is a continuation-in-part of Ser. No. 779,886, Mar. 21, 1977, abandoned. This application Nov. 13, 1979, Ser. No. 93,553

Int. Cl.³ A01N *37/34, 37/44;* C07C *101/44, 121/78*

U.S. Cl. 424—304 63 Claims

36. Isovaleric acid ester derivatives expressed by the general formula I:

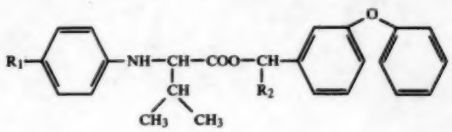


wherein,

R_1 represents hydrogen, methyl group or chlorine atom, and

R_2 represents hydrogen or cyano group.

45. An insecticidal composition comprising a carrier and as its essential ingredient an insecticidally effective amount of an isovaleric acid ester derivative of the general formula:



wherein,

R_1 represents hydrogen, a methyl group, or a chlorine atom and

R_2 represents hydrogen or a cyano group.

4,411,913
8'-[(3-AMINO-2-HYDROXY-PROPOXY)]-SPIRO-[CYCLOPENTANE-1,2'(1'H)-(3'H)NAPHTALEN]-4'(3'H)-ONES

Trevor G. Payne, Arlesheim, and Richard Berthold, Bottmingen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

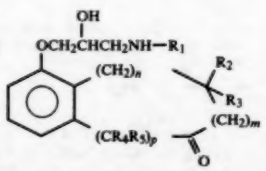
Continuation of Ser. No. 890,656, Mar. 20, 1978, abandoned. This application Mar. 5, 1979, Ser. No. 17,476

Claims priority, application Switzerland, Jan. 17, 1979, 445/79

Int. Cl.³ A01N *33/02*

U.S. Cl. 424—330 10 Claims

1. A compound of formula I



wherein

(i) m is 0, n is 2 and p is 1 or

(ii) m is 0 or 1, n is 1, and p is 1 or

(iii) m is 1, n is 1 or 2 and p is 0,

R_1 is (i) alkyl of 3 to 7 carbon atoms or (ii) phenylalkyl, phenoxyalkyl or phenylthioalkyl of 8 to 11 carbon atoms in the aggregate thereof and wherein the phenyl ring is separated by at least 2 carbon atoms from the nitrogen atom to which R_1 is bound and wherein the phenyl ring is unsubstituted, or mono-substituted by, or independently disubstituted by, alkyl or alkoxy of 1 to 4 carbon atoms, halogen of atomic number from 9 to 35, trifluoromethyl or cyano,

R_2 and R_3 are together straight chain alkylene of 4 to 6 carbon atoms, and

R_4 and R_5 are the same and are hydrogen or alkyl of 1 to 4 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof.

5. A method of treating, or preventing the further development of, a coronary disorder selected from arterial hypertension; acute cardiac infarct; myocardial infarction; and hyperlipidemia and hyperglycemia and increased appetite induced by emotional stress, which comprises administering a therapeutically effective amount of a compound of claim 1 to an animal in need of such treatment.

4,411,914
PROCESS FOR THE PRODUCTION OF A COLLOIDALLY STABLE BEER

Andre F. O. Devreux, Mons, and Janis Jerumanis, Wavre, both of Belgium, assignors to Compagnie Internationale de Participation et d'Investissement Cipari S.A., Luxembourg, Luxembourg

Continuation of Ser. No. 156,531, Jun. 5, 1980, abandoned. This application Dec. 3, 1981, Ser. No. 326,988

Claims priority, application France, Jun. 7, 1979, 79 14556

Int. Cl.³ C12G *3/00*

U.S. Cl. 426—12 13 Claims

1. In a process for preparing a colloidally stable beer, the improvement which comprises adding to a mixture of malt flour and water during preparation of a brew, while said mixture is maintained in contact with oxygen, a sufficient amount of polyphenoloxidase for precipitating the polymers formed by oxidation of the polyphenols by said polyphenoloxidase jointly with the present proteins and removing the obtained precipitate by filtration after oxidation of the wort.

4,411,915
HEME-IRON-ENRICHED AMINO ACID AND A PROCESS FOR THE PREPARATION OF HEME-IRON-ENRICHED AMINO ACID

Caj Eriksson, Näverlursvägen 1, 435 00 Mölnlycke, Sweden

Filed Apr. 18, 1981, Ser. No. 255,218

Int. Cl.³ A23J *1/06;* C12P *21/06*

U.S. Cl. 426—32 12 Claims

3. A process for the preparation of heme-iron-enriched amino acid preparations from heme-proteins, wherein the heme-protein is first hemolyzed and denaturated and subsequently split up with the aid of proteolytic enzymes and forming one heme-iron-enriched fraction and one fraction which does not contain heme-iron and recovering the heme-iron-enriched fraction by separation and stabilizing it by heat treatment and dewatering.

4,411,916
METHOD OF PRODUCING MILK FACTOR

George V. Mann, Nashville, Tenn., assignor to Vanderbilt University, Nashville, Tenn.

Continuation-in-part of Ser. No. 209,835, Nov. 24, 1980, abandoned. This application Jun. 21, 1982, Ser. No. 390,309

Int. Cl.³ A23C *9/12;* C12P *1/04;* C12R *1/39;* A61K *35/00*

U.S. Cl. 426—43 7 Claims

1. The method of producing Milk Factor (MF), comprising:

(a) propagating an MF-producing strain of *Pseudomonas fluorescens* to obtain a culture thereof for use as an inoculant;

(b) inoculating an aqueous culture medium with said culture,

said medium containing milk or milk protein as the principal constituent thereof and also containing an effective amount of glutaconic acid or a soluble salt thereof for enhancing the production of MF in said medium; and

(c) propagating said culture in said medium with concomitant production of MF therein.

4,411,917
FABRICATED SHELLFISH PRODUCTS CONTAINING WHEY PROTEIN CONCENTRATE COMPOSITION AND METHOD OF PREPARATION

Pei K. Chang, Montrose, N.Y., assignor to Nutrisearch Company, Cincinnati, Ohio

Filed Nov. 23, 1981, Ser. No. 324,321
Int. Cl.³ A23J *3/00*; A23L *1/33*
U.S. Cl. 426—104 **40 Claims**

1. A fabricated seafood product comprising a major proportion of seafood meat and a binding agent comprising:

(1) a whey protein concentrate composition having at least 30% protein, wherein at least 50% of the protein in the whey protein concentrate composition is whey protein, and

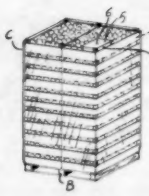
(2) a member selected from the group consisting of: (a) from about 1.25% to about 3% sodium tripolyphosphate, and (b) from about 0.4 to about 1.25% sodium tripolyphosophate in combination with a food grade, nonphosphorus-containing alkalizing agent,

the pH of said fabricated seafood product being within the range of from about 7.0 to about 7.75.

4,411,918
APPARATUS FOR PRESERVING FOOD BY GENERATING PRESERVATIVE GAS

Andrea Cimino, Bologna; Gianni Plicchi, S. Lazzaro di Savena; Luigi Mangiarotti, Bologna; Maurizio Rossi, Badia Polesine; Vittorio Betti, Faenza; Massimo Spighi, and Gabriele Zingaretti, both of Bologna, all of Italy, assignors to Kontek - Tecnologie della Conservazione - S.R.L., Bologna, Italy

Filed Mar. 24, 1981, Ser. No. 247,118
Claims priority, application Italy, Mar. 26, 1980, 12495 A/80
Int. Cl.³ B65D *81/20*
U.S. Cl. 426—124 **1 Claim**



1. An apparatus for the preservation of perishable food products such as fruits and vegetables contained in a storage and/or transport receptacle formed by a stack of superposed crates or trays, comprising:

(a) a gas-tight wrapping comprising a plastic sheet adapted to be pierced and enclosing the said receptacle containing the food products;

(b) a device for the generation of preservative gas or gas mixtures, said device being located at the interior of said receptacle enclosed by said wrapping, said device comprising:

a main container (1) comprising a basin-like, water-impervious container closed at the top by a pierceable cover lid (5) in a non-gas-tight manner, said main container having a solid chemical reagent substance therein;

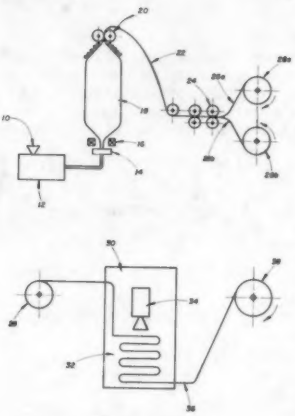
an auxiliary container (4) supported at the interior of said main container (1) at a pre-determined distance from the bottom thereof by support surfaces (3, 103) in the sides of the main container (1), said auxiliary container (4) being completely sealed in a liquid-tight manner and adapted to be pierced, and containing a liquid chemical reagent substance which upon contact with the solid chemical reagent causes a chemical reaction which generates the preservative gas or gas mixtures;

said device for the generation of preservative gas being located at the interior of said receptacle in such a position that the said cover lid (5) of the main container (1) and the said auxiliary container (4) can be pierced, from the outside of the wrapping enclosing the receptacle, by one single piercing operation which allows the liquid chemical reagent to contact the solid chemical reagent.

4,411,919
MEAT ADHEARING COOK-IN PACKAGING

Henry B. Thompson, Duncan, S.C., assignor to W. R. Grace & Co., Cryovac Division, Duncan, S.C.

Filed Aug. 16, 1982, Ser. No. 408,550
Int. Cl.³ B65B *29/08*
U.S. Cl. 426—412 **11 Claims**



1. A method for enhancing yield of cook-in packaged meat product, comprising:

(a) providing an adhering cook-in package comprising a flexible plastic container being substantially conformable to a selected meat product and having an inner meat product contacting surface of polymeric olefin having been subjected to an energetic radiation surface treatment in the presence of oxygen sufficient to cause said inner surface to adhere to the meat product during cook-in, said container having been formed from hot blown tubular film;

(b) conforming said package about a selected meat product; and

(c) cooking the packaged product, whereupon said inner surface adheres to said meat product to substantially prevent cook-out of fluids therefrom.

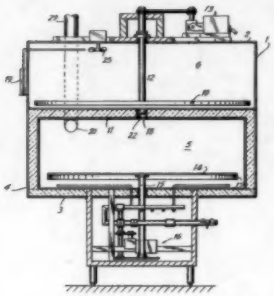
4,411,920
PROCESS FOR BAKING PIES

Bernard F. Fenoglio, 55 Evelyn Ter., South Amboy, N.J. 08879

Continuation-in-part of Ser. No. 128,680, Mar. 10, 1980, Pat. No. 4,305,329. This application Aug. 24, 1981, Ser. No. 295,663
Int. Cl.³ G01N *33/02*; A23L *1/10*
U.S. Cl. 426—233 **12 Claims**

1. A process for baking pies for quick serving in a turntable oven having a constantly rotating turntable, rotating at a speed of one revolution in the time to complete the baking of a fresh pie comprising:

(a) placing fresh pies on the turntable;
(b) prebaking said pies at a temperature from about 400° F. to 600° F. for about four-fifths of a revolution;
(c) removing the partially baked pies from the turntable;
(d) storing the partially baked pies in a holding chamber maintained at a temperature of from about 140° F. to 200°



F. and a humidity of from about 40% to 70%, said humidity being controlled by instant steam injection and shut off in response to a humidity meter monitoring the same;
(e) replacing said stored pies onto the turntable and subjecting the pies to intense heat baking for the remaining about one-fifth of a revolution; and
(f) removing the fully baked pies for serving.

4,411,921

METHOD FOR INHIBITING FUNGAL GROWTH ON FRESH FRUITS AND VEGETABLES

Richard E. Woodruff, Salinas, Calif., assignor to TransFRESH Corporation, Salinas, Calif.

Continuation of Ser. No. 18,934, Jun. 9, 1979, abandoned, which is a continuation of Ser. No. 784,528, Apr. 4, 1977, abandoned, which is a continuation-in-part of Ser. No. 638,619, Dec. 8, 1975, abandoned. This application Mar. 8, 1982, Ser. No. 355,327

The portion of the term of this patent subsequent to Jun. 24, 1997, has been disclaimed.

Int. Cl.³ A23B *7/152*

U.S. Cl. 426—263 **23 Claims**

1. A process for inhibiting the growth of fungi on fresh fruits and fresh vegetables other than leafy and head vegetables comprising maintaining said fresh fruits and fresh vegetables in a modified gaseous atmosphere, including carbon dioxide in an amount from zero to about 20% by volume, molecular oxygen in an amount of about 1% to about 20% by volume, carbon monoxide in an amount of about 3% to about 25% by volume, with the remainder being substantially all molecular nitrogen, at a temperature in the range of about 29° F. to about 60° F. for a time sufficient to inhibit growth of fungi on said fresh fruits and fresh vegetables.

4,411,922

PROCESS FOR PREPARING COOKED MEAT HAVING REDUCED LEVELS OF N-NITROSAMINES

Richard F. Theiler, Scottsdale, Ariz., assignor to Armour and Company, Phoenix, Ariz.

Continuation-in-part of Ser. No. 286,743, Jul. 27, 1981. This application Dec. 28, 1981, Ser. No. 335,008

Int. Cl.³ A23B *4/02, 4/14*

U.S. Cl. 426—266 **5 Claims**

1. A process for preparing a cured meat product which, when cooked for consumption, contains substantially reduced levels of N-nitrosamines, said process comprising the steps of nitrite-curing, heat processing and slicing the meat product and then applying to the external surfaces of the resulting slices, after completion of said nitrite-curing and before cooking, a treating solution containing a tocopherol, liquid smoke, and reducing sugar.

4,411,923

PROCESS FOR THE EXTRACTION OF CAFFEINE FROM SUPER-CRITICAL SOLUTIONS

Peter Hubert, and Otto Vitzthum, both of Bremen, Fed. Rep. of Germany, assignors to HAG Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 824,128, Aug. 12, 1977, abandoned. This application Feb. 9, 1981, Ser. No. 234,071

Claims priority, application Fed. Rep. of Germany, Aug. 18, 1976, 2637197

Int. Cl.³ A23F *3/36, 5/20*

U.S. Cl. 426—271 **7 Claims**

1. Process for extracting caffeine from caffeine-containing natural substances using super-critical carbon dioxide as extracting agent wherein caffeine and non-caffeine substances are removed from said natural substances by the extracting agent, including the steps of
(a) selectively removing caffeine from the extracting agent with a polystyrene-based cation exchanger with sulfonic acid groups at a pressure between 100 to 300 bars;
(b) adding from 5% to 30% water based on the total weight of the cation exchange resin to moisten the caffeine-filled resin and thereby avoid explosion of the resin particles during and after release of the CO_2 gas; and
(c) regenerating said cation exchange resin by use of aqueous regenerating agents.

4,411,924

CREAM FLAVOR COMPOSITION FOR USE WITH BUTTERY FLAVORED FOOD PRODUCTS

Michael R. Sevenants, Forest Park, Ohio, assignor to The Procter & Gamble Co., Cincinnati, Ohio

Continuation of Ser. No. 299,701, Sep. 8, 1981, abandoned. This application Mar. 18, 1983, Ser. No. 476,650

Int. Cl.³ A23L *1/226*

U.S. Cl. 426—534 **33 Claims**

1. A cream flavor composition, which consists of:
(a) a carboxylic acid component in an amount of from about 0.0025 to about 350 ppm selected from the group consisting of 8-nonenoic acid, 9-decenoic acid, 10-undecenoic acid, and mixtures thereof; and
(b) a higher methyl ketone component selected from the group consisting of 2-undecanone in an amount of from about 0.0014 to about 600 ppm, 2-dodecanone in an amount of from about 0.0014 to about 600 ppm, 2-tridecanone in an amount of from about 0.0085 to about 800 ppm, 2-tetradecanone in an amount of from about 0.0085 to about 800 ppm, 2-pentadecanone in an amount of from about 0.0800 to about 1000 ppm, 2hexadecanone in an amount of from about 0.0080 to about 1000 ppm, and mixtures thereof.

4,411,925

BRANCHED AMIDES OF L-ASPARTYL-D-AMINO ACID DIPEPTIDES

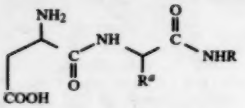
Thomas M. Brennan, Old Lyme, and Michael E. Hendrick, Groton, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 113,800, Jan. 21, 1980, abandoned. This application Nov. 5, 1980, Ser. No. 201,745

Int. Cl.³ A23L *1/236*

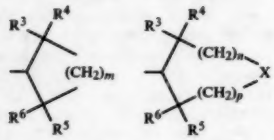
U.S. Cl. 426—548 **94 Claims**

1. An L-aspartyl-D-amino acid dipeptide amide of the formula

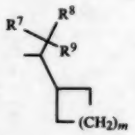


and the physiologically acceptable cationic and acid addition salts thereof, wherein R^a is methyl, ethyl, n-propyl or isopropyl; and

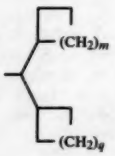
R is a branched member selected from the group consisting of fenchyl, diisopropylcarbinyl, d-methyl-t-butylcarbinyl, d-ethyl-t-butylcarbinyl, di-t-butylcarbinyl, 2-methylthio-2,4-dimethylpentan-3-yl,



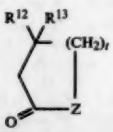
where at least one of R^3, R^4, R^5, R^6 is alkyl having from one to four carbon atoms and the remainder are hydrogen or alkyl having from one to four carbon atoms, X is O, S, SO, SO_2, C=O or CHOH; m is zero, 1, 2, 3 or 4, n and p are each zero, 1, 2 or 3 where the sum of n+p is not greater than 3 and the sum of the carbon atoms in R^3, R^4, R^5 and R^6 is not greater than six, and when both of R^3 and R^4 or R^5 and R^6 are alkyl they are methyl or ethyl,



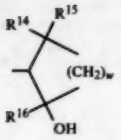
where one of R^7, R^8, R^9 is alkyl having from one to four carbon atoms and the remainder are hydrogen or alkyl having from one to four carbon atoms and the sum of the carbon atoms in R^7, R^8 and R^9 is not greater than six,



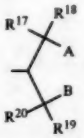
where m and q are the same or different and each have the values previously defined for m,



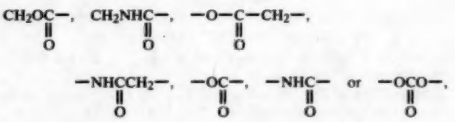
where each of R^{12} and R^{13} are methyl or ethyl, or R^{12} is hydrogen and R^{13} is alkyl having from one to four carbon atoms, Z is 0 or NH and t is 1 or 2,



where w is 1, 2, 3 or 4, R^{14} and R^{16} are each alkyl having from one to four carbon atoms, R^{15} is hydrogen, OH, or alkyl having from one to two carbon atoms, where the sum of the carbon atoms in R^{14}, R^{15} and R^{16} is not greater than six and when both of R^{14} and R^{15} are alkyl they are methyl or ethyl, and



where R^{17} and R^{19} are alkyl having from one to four carbon atoms, R^{18} and R^{20} are hydrogen or alkyl having from one to two carbon atoms, taken separately, A is OH and B is hydrogen, OH or methyl and when taken together A and B are



where the sum of the carbon atoms in R^{17}, R^{18}, R^{19} and R^{20} is not greater than six and when both of R^{17} and R^{18} or R^{19} and R^{20} are alkyl they are methyl or ethyl.

4,411,926

STABILIZER FOR FROZEN FOAMED EMULSIONS AND METHOD THEREFORE

Jerome F. Trumbetas, Tarrytown; Rex Sims, Pleasantville, and Joseph A. Fioriti, Hastings-on-Hudson, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Feb. 4, 1982, Ser. No. 345,873

Int. Cl.³ A23D *5/00;* **A23G** *9/02;* **A23J** *1/14, 1/20*

U.S. Cl. 426—565 **8 Claims**

1. An edible, frozen emulsion foam stabilizer comprising a co-dried, pH adjusted, protein-emulsifier complex having a pH between about 6.0 to about 9.0, wherein the protein is soy isolate, soy concentrate, sodium caseinate, or combinations thereof and the emulsifier is polysorbate 60, sodium stearoyl lactylate, sodium succinoylated glycerol monostearate, or a combination thereof and the ratio of emulsifier to protein is between 0.02 and 2 parts emulsifier per part protein.

4,411,927
METHOD FOR GRINDING CEREAL GRAINS IN THE PRESENCE OF GRINDING AIDS

Mauricio Bermudez, Miami, Fla.; Richard R. Klimpel, and Steven D. Sands, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 195,977, Oct. 10, 1980, abandoned, which is a continuation-in-part of Ser. No. 114,036, Jan. 21, 1980, abandoned. This application Jun. 30, 1982, Ser. No. 393,566

Int. Cl.³ A23L *1/00*

U.S. Cl. 426—618 **7 Claims**

1. A method for grinding cereal grains said method comprising grinding the cereal grain in the presence of an aqueous grinding medium, said aqueous grinding medium being employed in amounts from about 10 to about 80 weight percent based on the weight of the cereal grain and aqueous grinding medium, and an amount of a hydrophilic polysaccharide sufficient to increase grinding efficiency.

4,411,928
PROCESS FOR APPLYING A WATER AND ALCOHOL REPELLENT MICROBIOCIDAL FINISH TO A FABRIC AND PRODUCT SO PRODUCED

A. Frank Baldwin, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Continuation-in-part of Ser. No. 310,416, Oct. 9, 1981, and a continuation-in-part of Ser. No. 310,414, Oct. 9, 1981. This application Feb. 24, 1982, Ser. No. 352,057

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—2 **9 Claims**

1. A process for making a bioactive, water and alcohol repellent medical fabric comprising the steps of:

(a) applying a finishing bath composed, in percent by weight of the bath, of:

a C_1–C_4 alcohol	0.5–3.0%
3-(trimethoxysilyl)-propyloctadecyl dimethyl ammonium chloride	0.4–2.4%
a fluoropolymer alcohol repellent	1.25–5.0%
wax/resin fluoropolymer extender	1.0–6.0%
monovalent salt antistat	0.2–0.5%
water	balance

(b) drying the thus coated substrate to fix the coating to the non-woven substrate and provide a bioactive, water and alcohol repellent finished fabric.

4,411,929
METHOD FOR MANUFACTURING SEMICONDUCTOR DEVICE

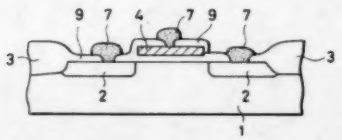
Shinichi Sato; Hiroshi Harada; Takaaki Fukumoto; Hirozo Takano; Hideo Kotani, and Shinpei Kayano, all of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha LSI Development Laboratory, Itami, Japan

Filed Aug. 18, 1981, Ser. No. 293,793

Claims priority, application Japan, Aug. 19, 1980, 55-114492

Int. Cl.³ H01L *21/28*

U.S. Cl. 427—38 **6 Claims**



1. A method of manufacturing a semiconductor device comprising the steps of: forming an ion bombardment layer having a configuration corresponding to a desired contact aperture configuration on at least one predetermined portion on a surface of a semiconductor substrate by direct ion beam imaging; and subjecting said ion bombardment layer to annealing to convert said ion bombardment layer to an oxidation-resistant layer.

4,411,930
METHOD AND APPARATUS FOR SURFACE-HARDENING TREATMENT OF SYNTHETIC RESIN ARTICLES

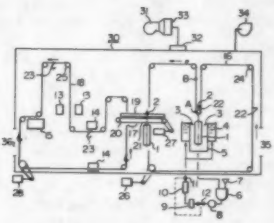
Atushi Nakazima, and Mitisuke Edamatu, both of Otake, Japan, assignors to Mitsubishi Rayon Company Ltd., Tokyo, Japan

Filed Aug. 2, 1982, Ser. No. 404,486

Claims priority, application Japan, Aug. 3, 1981, 56-121553; Mar. 23, 1982, 57-45982

Int. Cl.³ B05D *3/06*

U.S. Cl. 427—54.1 **5 Claims**



1. A method for coating the surface of a synthetic resin article and hardening said coating, wherein the synthetic resin article is brought into countercurrent contact with a freely falling liquid film of a surface-hardening solution while the synthetic resin article is gradually pulled up, to coat the surface of the synthetic resin article with the surface-hardening solution, and the coated synthetic resin article is irradiated with ultraviolet rays to cure the coating, said method being characterized in that (a) the synthetic resin article is conveyed to a hardening solution tank by a first conveyor where the synthetic resin article is coated with the hardening solution and the coated synthetic resin article is then conveyed to an ultraviolet ray-irradiating step by a second conveyor through an intermediate conveyor; (b) the surface-hardening solution is caused to flow down on liquid film guide plates attached to the hardening solution tank, at a flow rate of 2 to 15 ml per second and per cm of the width of the liquid film guide plate, and the countercurrent contact of the synthetic resin article with the liquid film is initiated at a point 3 to 30 mm apart from the flow-out end of the guide plates; and (c) the hardening solution is circulated to effect the temperature adjustment and filtration.

3. An apparatus for coating the surface of a synthetic resin article and hardening said coating, wherein the synthetic resin article is brought into countercurrent contact with a freshly falling liquid film of a surface-hardening solution while the synthetic resin article is gradually pulled up, to coat the surface of the synthetic resin article with the surface-hardening solution, and the coated synthetic resin article is irradiated with ultraviolet rays to cure the coating, said apparatus comprising (a) a conveyor device comprising a first conveyor for conveying the synthetic resin article to a hardening solution tank to coat the synthetic resin article with the surface-hardening solution, a second conveyor for conveying the synthetic resin article to an ultraviolet ray-irradiating device and an intermediate conveyor for transferring hangers each having the synthetic resin article hung thereon from the first conveyor to the second conveyor; (b) a device comprising guide plates attached to the hardening solution tank in the state inclined downwardly at an angle of 10° to 80° with respect to the

horizontal direction to form a freely falling liquid film of the surface-hardening solution, with which the surface of the synthetic resin article is brought into countercurrent contact; (c) a device comprising a pump for circulating the solution through a pipe line from and to the hardening solution tank, and a filter, a heat exchanger, a flow rate-controlling valve and a flow rate-detecting pressure gauge or flowmeter, which are arranged downstream of the circulating pipe line; and (d) a device comprising a substantially closed treating chamber integrally surrounding said conveyor device, hardening solution tank and ultraviolet ray-irradiating device, an air feed fan for feeding air into said treating chamber, a filter for removing dusts from air and an air conditioner for adjusting the temperature and humidity of air.

4,411,931

MULTIPLE STEP UV CURING PROCESS FOR PROVIDING ACCURATELY CONTROLLED SURFACE TEXTURE

Chau H. Duong, East Lampeter Township, Lancaster County, Pa., assignor to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Sep. 29, 1982, Ser. No. 426,677
Int. Cl.³ B05D *3/06*
U.S. Cl. 427—54.1 **10 Claims**

1. A process for accurately controlling the surface texture of UV-curable substrates, said process comprising the steps of

exposing a UV-curable substrate having a thickness of not less than about two mils to an ultraviolet light source which emits a wave length of from about 3000 to about 4200 angstroms for a period of time which will cause the bottom portion of said substrate to gel but which will have essentially no effect on the upper surface of said substrate;

blanketing the partially gelled substrate with an inert gas and exposing said substrate to a low-pressure mercury ultraviolet light source to gel the upper surface of said substrate and cause development of a desired surface texture; and

exposing the gelled substrate to a strong ultraviolet light source to effect final curing and essentially fix the surface texture.

4,411,932

METHOD FOR THE PREVENTION OF SOILANT DEPOSITS ON CONTACT LENSES

Stephen C. Kwan, Arlington, Tex., assignor to Alcon Laboratories, Inc., Fort Worth, Tex.

Filed Nov. 23, 1981, Ser. No. 324,273
Int. Cl.³ G02B *1/10*; B08B *17/02*; B05D *1/18*
U.S. Cl. 427—164 **7 Claims**

1. A method for preventing soil encrustation on a soft contact lens comprising exposing the soft contact lens to an aqueous solution which comprises a composition selected from the group consisting of poly(ethylene glycol) having a molecular weight in the range from about 500 to about 15,000, alkyl ethers of polyethylene glycol having a molecular weight in the range from about 550 to about 5,000, polyethylene oxide having a molecular weight in the range from about 100,000 to about 5,000,000, and mixtures thereof.

4,411,933

PROCESS FOR PREPARING ETHYLCELLULOSE MICROCAPSULES

Masayoshi Samejima, Minoh, and Goichi Hirata, Yawata, both of Japan, assignors to Tanabe Seiyaku Co., Ltd., Osaka, Japan

Filed Apr. 9, 1981, Ser. No. 252,457
Claims priority, application Japan, Apr. 25, 1980, 55-55808
Int. Cl.³ B01J *13/02*; A01N *25/28*; A61K *9/62*
U.S. Cl. 427—213.3 **15 Claims**

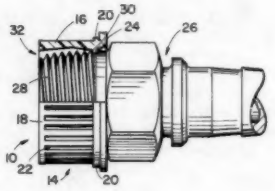
1. In a process for preparing ethylcellulose microcapsules comprising the steps of (i) dissolving ethylcellulose in cyclohexane, (ii) dispersing particles of a core material in said solution, (iii) cooling the dispersion until the ethylcellulose separates out from the dispersion to form coating walls on and around the particles of said core material, and then (iv) recovering the thus-formed ethylcellulose microcapsules therefrom, the improvement wherein an organosilicon polymer is dissolved in said cyclohexane in said step (i) in an amount of 0.1 to 10 w/v %, said organosilicon polymer having a viscosity of 50 to 5 million centistokes at 25° C. and said ethylcellulose being present in an amount of 0.1 to 10 w/v %.

4,411,934

METHOD FOR PLATING A THREADED MEMBER WITH AN IN SITU THREAD PROTECTOR

Thomas C. Steinhagen, Westminster, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Division of Ser. No. 205,847, Nov. 10, 1980. This application Sep. 24, 1982, Ser. No. 423,484
Int. Cl.³ B05D *3/00, 3/12*
U.S. Cl. 427—242 **2 Claims**



1. A method for plating and protecting at least one threaded member comprising the steps of:

positioning a sleeve-like polymeric thread protector having a perforate sidewall over threads of the threaded member and retaining the protector in position over the threads;

placing the threaded member with polymeric protector in a plating solution and exposing the threads to the solution through the perforate sidewall; plating the threaded member and

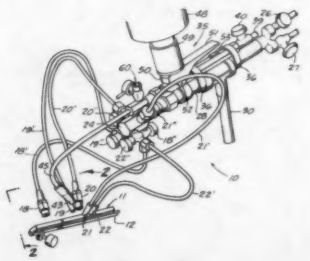
retaining the thread protector over the threads and protecting the threads until the threaded member is ready for use.

4,411,935

POWDER FLAME SPRAYING APPARATUS AND METHOD

James Y. Anderson, 1838 Cliffhill Dr., Monterey Park, Calif. 91754

Filed Nov. 2, 1981, Ser. No. 317,383
Int. Cl.³ B05D *1/08*
U.S. Cl. 427—318 **35 Claims**



31. That method of applying hardfacing directly to an uncoated metallic body which comprises:

progressively heating successive merging areas of said uncoated metallic body by a plurality of flames including a

preheater flame and a plurality of final heater flames the latter of which have merging flame envelopes and are spaced upstream from said preheater flame and which plurality of flames cooperate to bring the metal surface to a temperature effective to fuse hardfacing powder thereto; and dispensing hardfacing powder at substantially ambient temperature into the merging flame envelopes of said final heater flames while advancing said flames and said metallic body past one another along substantially the shortest path between said progressively heated areas and at the rate at which said flames cooperate in bringing said progressively heated surface areas of said metallic body to a temperature to fuse said hardfacing powder thereto.

4,411,936

SPRAYED ALLOY LAYER AND METHOD OF MAKING SAME

Nils G. Schrewelius, Hallstahammar, Sweden, assignor to Bulten-Kanthal AB, Hallstahammar, Sweden

Continuation of Ser. No. 54,414, Jul. 3, 1979, abandoned. This application Oct. 23, 1980, Ser. No. 199,699

Claims priority, application Sweden, Jul. 4, 1978, 7807523

Int. Cl.³ B05D *1/08*

U.S. Cl. 427—367 **5 Claims**

1. A method for producing a metal layer on a substrate which comprises flame spraying an iron, chromium, and aluminum alloy in the form of a wire in a flame spray gun under conditions of mild oxidation to produce a layer consisting essentially of from 10 to 35% by weight chromium, 1 to 12% by weight aluminum, 0.008 to 0.025% by weight nitrogen, 0.01 to 1.25% by weight oxygen predominantly as oxides of aluminum, iron, and chromium, with the balance substantially iron, the oxidation being sufficient to cover the metal particles partially in the form of extremely fine oxide films having thicknesses on the order of 0.1 to 0.5 micron but being sufficiently discontinuous to permit diffusion of aluminum to the surface.

4,411,937

PROCESS AND COMPOSITION FOR COATING METALS

Takao Nishida, and Takashi Hirohata, both of Osaka, Japan, assignors to Amchem Products, Inc., Ambler, Pa.

Division of Ser. No. 150,082, May 15, 1980, Pat. No. 4,347,172, which is a continuation of Ser. No. 797,758, May 17, 1977, abandoned, which is a continuation-in-part of Ser. No. 445,434, Feb. 25, 1974, abandoned, which is a continuation of Ser. No. 232,625, Mar. 7, 1972, abandoned. This application Jun. 14, 1982, Ser. No. 388,420

Claims priority, application Japan, Mar. 10, 1971, 46-012462

Int. Cl.³ B05D *1/18*

U.S. Cl. 427—435 **37 Claims**

1. In a process wherein a resinous coating is applied to a metallic surface by contacting it with an acidic aqueous coating composition which chemically attacks said surface and dissolves metal therefrom, said composition containing dispersed solid particles of resin and dissolved ferric iron, the source of the ferric iron including a source other than said metallic surface, the improvement comprising effecting the formation of said coating with said composition having incorporated therein dissolved fluoride, said composition containing said dissolved fluoride being capable of forming on a metallic surface immersed therein, and in a substantially electrostatic field-free environment, a resinous coating which increases in amount during at least a portion of the time said surface is immersed in said composition.

27. In a process wherein a resinous coating is applied to a metallic surface by immersing it in an acidic aqueous coating composition which chemically attacks said surface and dissolves metal therefrom, said composition containing dispersed solid particles of resin and a material which is effective in increasing the rate at which the composition dissolves metal, and wherein said composition is capable of forming on a metallic surface immersed therein a resinous coating which increases in amount during at least a portion of the time said surface is immersed in said composition, said composition being effective to form said resinous coating in a substantially electrostatic field-free environment, the improvement comprising effecting the formation of said coating with said composition having incorporated therein dissolved ferric fluoride which is effective in increasing the rate at which metal is dissolved from said surface, and said composition being substantially free of an oxygen-containing oxidizing agent in an amount which effects a further increase in the rate at which metal is dissolved from said surface.

4,411,938

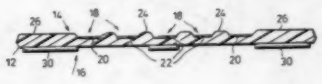
MULTI-GROOVE TRIM

Ciro Madonia, 1390 Beaufort Dr., Burlington, Ontario; Christopher Hatzikelis, R.R. #1,, Palgrave, Ontario, and Cesare C. Cosentino, 45 Grandview Ave., Thornhill, Ontario, all of Canada

Continuation of Ser. No. 149,468, May 13, 1980, abandoned. This application Nov. 9, 1981, Ser. No. 319,140

Int. Cl.³ B32B *27/06, 3/30*

U.S. Cl. 428—31 **1 Claim**



1. A decorative and protective plastic trim, comprising an extruded plastic base of generally rectangular section with a pair of opposed major faces bounded by a pair of minor sides to provide a slim, low profile base section; one said major face having a plurality of spaced apart contact adhesive strips in adherent relation therewith, for attaching the plastic section to the side of a vehicle; the other said major face having a plurality of valley recesses extending along the base, a plurality of shoulder portions and raised edge portions extending in protective relation and serving to define said recesses and metallized laminate decorative strips extending in adherent relation along at least some said recesses having protective overcoatings thereover.

4,411,939

CONFORMABLE REINFORCEMENT BOARD

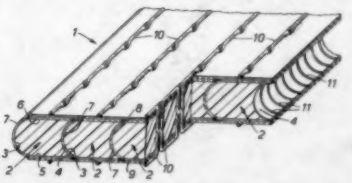
Robert D. Hawkins, and James A. Hawkins, both of Thrumpton, England, assignors to National Research Development Corporation, London, England

Filed Nov. 26, 1980, Ser. No. 210,794

Claims priority, application United Kingdom, Nov. 28, 1979, 7941054; May 31, 1980, 8017867

Int. Cl.³ B32B *3/04, 3/06*

U.S. Cl. 428—58 **11 Claims**



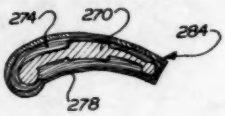
1. A board for use in reinforced synthetic resin constructions comprising: a plurality of core strips arranged in closely spaced side by side relation with facing edge surfaces of complementary shape; fibrous reinforcement material interposed between said facing edge surfaces of the strips and lying flat against the outer faces of the board, and adhesive attaching said fibrous material to the core strips at spaced apart locations to form a

unitary board; the board being in an unprocessed state in which it has yet to be transformed from a relatively weak structure into a relatively strong, rigid structure by the curing of resin impregnated into said fibrous material.

4,411,940
AIRFOIL

Thomas Derkacs, Mayfield; Charles W. Fetheroff, Willowick; Istvan M. Matay, North Royalton, and Istvan J. Toth, Richmond Heights, all of Ohio, assignors to TRW Inc., Cleveland, Ohio

Division of Ser. No. 923,693, Jul. 11, 1978, abandoned. This application Apr. 12, 1982, Ser. No. 367,277
Int. Cl.³ B64C *1/00*; B32B *3/00, 3/12*
U.S. Cl. 428—73 **3 Claims**

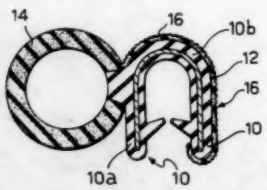


1. An airfoil comprising a root end portion, a tip end portion, a pair of edge portions extending between said tip and root end portions, a pair of major side portions extending between said edge portions, at least one of said portions having a sprayed covering thereon, said covering including a plurality of layers formed of strips which were sequentially sprayed on at least the one portion of the airfoil, said covering as sprayed having a thickness which varies by an amount which is less than 0.003 of an inch measured in the direction of application of the covering.

4,411,941
SEALING STRIP FOR VEHICLE BODIES

Roberto Azzola, Turin, Italy, assignor to Saiag S.p.A. Industria Articoli Gomma, Cirie', Italy

Division of Ser. No. 193,212, Oct. 1, 1980, Pat. No. 4,381,273. This application Sep. 17, 1982, Ser. No. 419,276
Claims priority, application Italy, Dec. 21, 1979, 69460 A/79
Int. Cl.³ E06B *7/16*
U.S. Cl. 428—122 **4 Claims**

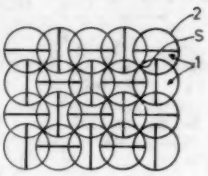


1. A sealing strip for vehicle bodies comprising a channel-shaped attachment profile of solid rubber having embedded therein a metallic reinforcing strip, wherein the attachment profile has on its exposed surface a coating layer of sponge rubber co-extruded and co-vulcanized with the profile so as to be of one piece integral construction therewith and wherein the exposed surface of the coating layer is rendered velvety by abrasion.

4,411,942
PACKING FOR TECHNICAL PROCESSES

Andreas Nickel, Hagen; Karl H. Reissinger, Leverkusen; Hans-Walther Brandt, Odenthal, all of Fed. Rep. of Germany, and Thomas Melin, Berkeley, Calif., assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 27, 1981, Ser. No. 315,382
Claims priority, application Fed. Rep. of Germany, Nov. 18, 1980, 3043420; Dec. 24, 1980, 3048968
Int. Cl.³ B32B *3/10*
U.S. Cl. 428—137 **9 Claims**

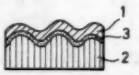


1. In a packing for fluid treatment, the improvement comprising: a plurality of twisted strips stacked parallel to each other in an axially symmetric arrangement, wherein the strips are pleated perpendicular to the axis of the strip and twisted in the same rotational sense and the twisted strips are staggered in relation to each other to form groups of continuous channels, each group extending in a straight line in four axially symmetric directions whose projections in a horizontal plane form an angle of 90° with each other and whose angle α with respect to the longitudinal axis of the packing is $\tan \alpha = b/h \cdot \sqrt{2}$, where h is the pitch and b the width of the twisted strips.

4,411,943
FRICTION SHEET

Mutsuo Akao, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Sep. 4, 1981, Ser. No. 299,422
Claims priority, application Japan, Sep. 5, 1980, 55-123068
Int. Cl.³ B32B *3/00, 23/08*
U.S. Cl. 428—161 **15 Claims**



1. A friction sheet for an inner surface of a case containing a tape roll and a friction sheet which is subject to sliding contact with a tape roll accommodated in the case, said friction sheet comprising a flexible support regularly embossed on the side thereof intended for contact with the tape roll and at least one uniaxially orientated high density polyethylene film composed mainly of a high density polyethylene having a density of at least 0.94 g/cm^3 bonded onto the embossed surface of the flexible support.

4,411,944
SURFACE MOUNTED TRIM PIECE

Ronald D. Moore, Grosse Pointe, Mich., assignor to Chivas Products Limited, Sterling Heights, Mich.

Filed Jun. 1, 1981, Ser. No. 268,794
Int. Cl.³ B60R *13/02*
U.S. Cl. 428—172 **18 Claims**

1. A trim piece for attachment to a vehicle surface comprising:

a relatively rigid support member, said support member having an unbeveled edge;

a foam padding adjacent said support member; and

a cover exterior of said padding securely bonded to the face side of said support member adjacent said edge of said support member so as to encapsulate said padding and

terminating contiguous and slightly beyond said edge without enveloping said edge so that, upon attachment of said trim piece to said surface, the cover will engage said surface substantially at the termination of said cover.

4,411,945

FRICTION SHEETS

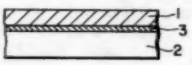
Mutsuo Akao, and Haruo Furuta, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 24, 1981, Ser. No. 247,030

Claims priority, application Japan, Mar. 24, 1980, 55-37320

Int. Cl.³ B32B *5/16, 27/08*

U.S. Cl. 428—216 **28 Claims**



1. A laminated friction sheet, comprising:

a first layer of a uniaxially oriented high density polyethylene film having a density of at least 0.94 g/cm³;

a second layer of a uniaxially oriented high density polyethylene film having a density of at least 0.94 g/cm³, connected to the first layer by an adhesive layer positioned between said first and second layer.

20. A laminated friction sheet, comprising:

a first flexible sheet layer; and

a layer of a uniaxially oriented high density polyethylene film having a density of 0.94 g/cm³, connected to said first flexible sheet layer by an adhesive layer positioned between said first flexible sheet layer and said uniaxially oriented high density polyethylene film.

4,411,946

IMPREGNATING PAPER WITH 7-HYDROXY-COUMARIN COMPOUNDS

Horst Harnisch, Much, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

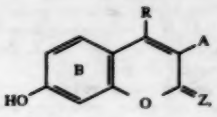
Filed Dec. 22, 1981, Ser. No. 333,517

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1981, 3100295

Int. Cl.³ B32B *21/04;* **D21H** *5/10*

U.S. Cl. 428—219 **8 Claims**

1. Security paper having incorporated therein between about 0.01 and about 0.2 grams per meters² of a 7-hydroxy-coumarin compound of the general formula



wherein

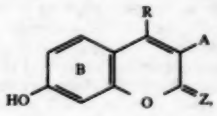
A represents a heterocyclic radical belonging to the benzthiazole, benzoxazole, benzimidazole, quinazol-4-one, benzo (b) thiophene, benzo (b) furan, 5-phenyl-1,3,4-oxadiazole, 5-phenyl-1,3,4-thiadiazole or pyridine series and the substituents on A are chosen from the series C_1- to C_4-alkyl, C_1- to C_4-alkoxy, phenyl-C_1- to C_3-alkyl, cyclohexyl, phenyl which is unsubstituted, monosubstituted or disubstituted wherein said substitution is by C_1- to C_4-alkyl, C_1- to C_2-alkoxy and/or chlorine, trifluoromethyl, C_1- to C_4-alkoxycarbonyl, carboxyl, carbamoyl groups or sulphamoyl groups which are unsubstituted, monosubstituted or disubstituted wherein said substitution is by C_1- to C_4-alkyl radicals, C_1- to C_4-alkylsulphonyl, phenyl-C_1- to C_3-alkylsulphonyl, phenylsulphonyl, C_1- to C_4-alkylmercapto and phenylmercapto,

R represents hydrogen or cyano and

Z represents oxygen or NH and

the ring B is further unsubstituted or substituted nonionically by a C_1- to C_3-alkyl group or chlorine.

5. A process for impregnating paper which comprises effecting impregnation by means of 7-hydroxy-coumarin compounds of the general formula



wherein

A represents a heterocyclic radical belonging to the benzthiazole, benzoxazole, benzimidazole, quinazol-4-one, benzo (b) thiophene, benzo (b) furan, 5-phenyl-1,3,4-oxadiazole, 5-phenyl-1,3,4-thiadiazole or pyridine series and the substituents on A are chosen from the series C_1- to C_4-alkyl, C_1- to C_4-alkoxy, phenyl-C_1- to C_3-alkyl, cyclohexyl, phenyl which is unsubstituted, monosubstituted or disubstituted wherein said substitution is by C_1- to C_4-alkyl, C_1- to C_2-alkoxy and/or chlorine, trifluoromethyl, C_1- to C_4-alkoxycarbonyl, carboxyl, carbamoyl groups or sulphamoyl groups which are unsubstituted, monosubstituted or disubstituted wherein said substitution is by C_1- to C_4-alkyl radicals, C_1- to C_4-alkylsulphonyl, phenyl-C_1- to C_3-alkylsulphonyl, phenylsulphonyl, C_1- to C_4-alkylmercapto and phenylmercapto, R represents hydrogen or cyano and Z represents oxygen or NH and the ring B is further unsubstituted or substituted non-ionically by a C_1- to C_3-alkyl group or chlorine.

4,411,947

CONVEYOR BELT

Ingo Heynhold, Kalefeld, Fed. Rep. of Germany, assignor to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Nov. 10, 1981, Ser. No. 320,009

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1980, 3042473

Int. Cl.³ D03D *3/00;* **B32B** *7/00*

U.S. Cl. 428—250 **1 Claim**

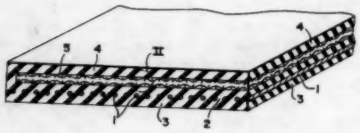
1. A conveyor belt of relatively short length and made of elastomeric material for use as a discharge or feeder belt, the conveyor belt being particularly suitable for absorbing the

heavy impact loads of materials having angular edges falling upon the belt, the conveyor belt comprising:

an upper cover layer of elastomeric, wear-resistant rubber, having an upper surface upon which the material to be conveyed impacts and rests;

an elastically deformable insert of doubleweave cloth disposed beneath the upper cover layer which provides an air space within the upper cover layer; the doubleweave cloth comprising upper and lower webs each having longitudinally extending fabric strands, the upper and lower webs being joined by connecting strands woven between the longitudinally extending fabric strands of the upper and lower webs;

a core layer of readily bondable rubber adjacent to the deformable insert;



an array of parallel steel cables within the core layer and bonded to the core layer for reinforcing the elastomeric conveyor belt;

a lower cover layer of elastomeric, wear-resistant rubber; and

elastomeric material extending longitudinally along the outside edges of the belt and being sealed to the elastomeric layers to completely surround the doubleweave material within the belt and entrap air within the belt, whereby impacts on the upper cover layer are absorbed by the elastically deformable layer and entrapped air prior to being transmitted to the elastomeric layer, steel cables and lower cover layer for which layers the elastically deformable layer and entrapped air form a cushion thereby prolonging the life of the conveyor belt.

4,411,948

AIR FILTER OF THREE-DIMENSIONAL MESH-STRUCTURED WEBS

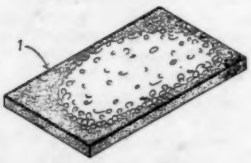
Fumiichi Ogino, Kawanishi, and Koji Nakashima, Suita, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 78,718, Sep. 25, 1979, abandoned. This application Mar. 24, 1981, Ser. No. 247,166

Claims priority, application Japan, Apr. 18, 1979, 54/48137

Int. Cl.³ B32B *5/16*

U.S. Cl. 428—283 **7 Claims**



1. Air-cleaning filter element which comprises at least two sheets of three-dimensionally mesh-structured elastic-flexible webs of skeletal structure containing 9 to 31 air spaces per 25 linear mm and having 3 mm to 10 mm thickness as superimposed and activated carbon adsorbent of a grain size of 1 to 5 mm in diameter which is bonded to and between the webs with a pressure-sensitive adhesive, the amount of activated carbon adsorbent deposited being 200 to 2500 g. per m^2 of web.

4,411,949

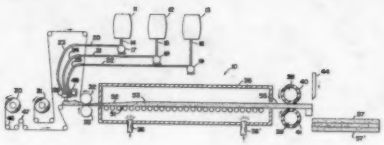
POLYMERIC FOAMS FROM TRANSESTERIFIED BY-PRODUCT DERIVED FROM MANUFACTURE OF DIMETHYL TEREPHTHALATE AND LAMINATES THEREFROM

Scott C. Snider, Pinellas Park, and Alberto DeLeon, Clearwater, both of Fla., assignors to The Celotex Corporation, Tampa, Fla.

Filed Feb. 1, 1982, Ser. No. 344,459

Int. Cl.³ C08G *18/14;* **B32B** *3/26, 31/14;* **B29C** *23/00*

U.S. Cl. 428—304.4 **31 Claims**



1. A polyisocyanurate foam comprising the reaction product of an organic polyisocyanate, a blowing agent, a trimerization catalyst, and a minor amount of a polyol mixture prepared by the transesterification, with a glycol of molecular weight from about 60 to 400, of a by-product fraction from the manufacture of dimethyl terephthalate, the major portion of said fraction comprising about 15 to 70 weight percent of dimethyl terephthalate, and about 85 to 30 weight percent of a mixture of monomethyl terephthalate, bi-ring esters and polymeric materials.

17. A laminate comprising at least one facing sheet adhered to a polyisocyanurate foam which comprises the reaction product of an organic polyisocyanate, a blowing agent, a trimerization catalyst, and a minor amount of a polyol mixture prepared by the transesterification, with a glycol of molecular weight from about 60 to 400, of a by-product fraction from the manufacture of dimethyl terephthalate, the major portion of said fraction comprising about 15 to 70 weight percent of dimethyl terephthalate, and about 85 to 30 weight percent of a mixture of monomethyl terephthalate, bi-ring esters and polymeric materials.

4,411,950

AUTODEPOSITED COATINGS WITH INCREASED SURFACE SLIP

Timothy J. C. Smith, Hatfield Township, Montgomery County, Pa., assignor to Amchem Products, Inc., Ambler, Pa.

Continuation of Ser. No. 66,858, Aug. 15, 1979, abandoned, which is a division of Ser. No. 917,560, Jun. 21, 1978, Pat. No. 4,186,226. This application May 18, 1981, Ser. No. 264,402

Int. Cl.³ B32B *5/16;* **B05D** *3/04*

U.S. Cl. 428—327 **10 Claims**

1. A metallic surface having thereon a resin coating comprising the fusion product of autodeposited resin particles and fused and concentrated in the surface layer thereof resin particles, which are different than said autodeposited resin particles in having a coefficient of friction lower than that of the resin of said autodeposited resin particles, the amount of said different resin particles in the resin coating being such that said resin coating has a higher degree of surface slip than a resin coating formed from said autodeposited resin particles.

6. A metallic surface having thereon a resin coating comprising the fusion product of autodeposited resin particles, said particles prepared by copolymerizing styrene, butadiene, vinylidene chloride, and methacrylic acid, and fused and concentrated in the surface layer thereof resin particles which are different than said autodeposited resin particles in having a coefficient of friction lower than that of the resin of said autodeposited resin particles, the amount of said different resin particles in the resin coating being such that said resin coating has a higher degree of surface slip than a resin coating formed from said autodeposited resin particles.

4,411,951

HIGH SOLIDS COATING COMPOSITION OF AN ENAMEL CONTAINING A RHEOLOGY CONTROL ADDITIVE OF SILICA AND POLYETHYLENE GLYCOL

Robert J. Barsotti, Franklinville, N.J., assignor to E. I. Du Pont de Nemours & Co., Wilmington, Del.

Filed Jul. 30, 1982, Ser. No. 403,304
Int. Cl.³ C08K 3/36, 5/06; C08G 61/28
U.S. Cl. 428—328 18 Claims

1. A coating composition comprising about 40–70% by weight of a binder of film-forming constituents and about 30–60% by weight of a nonaqueous liquid carrier, wherein the binder comprises a film-forming acrylic polymer containing polymerized alkyl methacrylate and alkyl acrylate monomers and having reactive carboxyl groups, hydroxyl groups, amide groups, glycidyl groups or a mixture of any of these groups and an alkylated melamine formaldehyde crosslinking agent; and in addition the composition contains about 0.1–10% by weight, based on the weight of the binder, of a rheology control additive consisting essentially of about

(1) 80–99.5% by weight, based on the weight of the rheology control additive, of colloidal hydrophilic fumed silica having a surface area of about 100–500 square meters per gram and a particle size of about 5–20 millimicrons and

(2) 0.5–20% by weight, based on the weight of the rheology control additive, of polyethylene glycol having a weight average molecular weight of about 6,000–10,000.

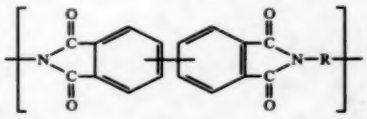
4,411,952

AROMATIC IMIDE POLYMER LAMINATE MATERIAL AND METHOD FOR PRODUCING THE SAME

Yoshikazu Sasaki; Hiroshi Inoue; Tadashi Miura; Kazuo Kumamoto, and Sumio Toudou, all of Hirakata, Japan, assignors to UBE Industries, Ltd., Osaka, Japan

Filed Apr. 20, 1982, Ser. No. 370,048
Claims priority, application Japan, May 6, 1981, 56-66888
Int. Cl.³ B32B 15/08, 7/02
U.S. Cl. 428—332 13 Claims

1. An aromatic imide polymer laminate material comprising at least one aromatic imide polymer film consisting essentially of at least one aromatic imide polymer which comprises at least 80 molar % of at least one type of recurring unit of the formula (1):



wherein R represents a divalent aromatic radical said polymer being characterized by a logarithmic viscosity of from 0.2 to 7 determined in a concentration of 0.5 g per 100 ml of p-chlorophenol at a temperature of 50° C., and a glass transition temperature of from 250° to 400° C.; and at least one metallic foil which is superimposed on and directly bonded to said aromatic imide polymer film without the presence of a bonding agent layer formed therebetween.

2. The laminate material as claimed in claim 1, wherein the thickness of said aromatic imide polymer film is in the range of from 10 to 200 microns.

4,411,953

MAGNETIC RECORDING MEDIUM

Takahito Miyoshi; Nobuo Tsuji; Toshimitu Okutu, and Masaaki Fujiyama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 19, 1982, Ser. No. 340,596
Claims priority, application Japan, Jan. 20, 1981, 56-6748
Int. Cl.³ H01F 10/00
U.S. Cl. 428—336 8 Claims

1. A magnetic recording medium, comprising:

a non-magnetic support base;

a magnetic layer provided on a first surface of said support base;

an undercoat formed on a second surface of said support base opposite said first surface, said undercoat having a thickness of 0.4μ or less; and

a back coating on said undercoat, said back coating having a thickness of 0.2–2μ; and comprising a particulate inorganic substance and a binder contained in a weight ratio of 2.5:1 to 0.1:1.

4,411,954

HOT MELT PRESSURE SENSITIVE ADHESIVE AND DIAPER TAPE CLOSURES COATED THEREWITH

Peter J. Butch, III, Valencia, Pa., and Paul P. Puletti, Glen Gardner, N.J., assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

Filed Aug. 16, 1982, Ser. No. 408,357
Int. Cl.³ C09J 7/02; C08F 4/00
U.S. Cl. 428—343 10 Claims

1. Pressure sensitive tape comprising a sheet backing coated with a layer of normally tacky and hot melt pressure-sensitive adhesive comprising

(a) 15 to 40% by weight of a mixture of an A-B-A styrene-isoprene-styrene copolymer and a selectively hydrogenated A-B-A type block copolymer wherein the non-elastomeric block A units in both A-B-A copolymers are present in amounts less than about 25% by weight and wherein the weight ratio of the styrene-isoprene-styrene copolymer to the selectively hydrogenated copolymer is within the range of 10:90 to 40:60;

(b) 30 to 70% by weight of a tackifying resin;

(c) 5 to 30% by weight of a plasticizing oil or liquid polyterpene tackifying resin; and

(d) 0.05 to 2.0% by weight of an antioxidant.

4,411,955

REACTIVE HARDENABLE BINDER MIXTURE, PROCESS FOR PREPARING HARDENED PRODUCTS AND USE OF THE MIXTURE FOR THE PREPARATION OF COATINGS

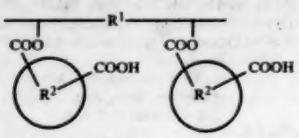
Josef Mondt, Königstein/Taunus; Gerd Walz, Wiesbaden, and Thaddäus Wirth, Heidenrod-Wisper, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Nov. 2, 1981, Ser. No. 316,806
Claims priority, application Fed. Rep. of Germany, Nov. 5, 1980, 3041653
Int. Cl.³ B32B 27/28; C08L 33/02, 63/00
U.S. Cl. 428—413 10 Claims

1. A reactive hardenable binder composition based on

(A) at least one aliphatic, cycloaliphatic or aliphatic-cycloaliphatic polyepoxide with a total epoxy equivalent weight between 80 and 500, wherein at least 2 epoxidized cycloaliphatic radicals are bound via an aliphatic bridge,

(B) at least one polycarboxylic acid unit of formula



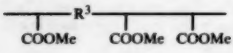
(I)

having an acid number between 30 and 400 wherein

R^1 is a radical of an at least oligomer product selected from the group consisting of polyesters and polymers having initially free OH-groups,

R^2 is a radical of a dicarboxylic carbocyclic acid having a COOH-group in ortho-position to its ester bond and

(C) a catalyst component of the formula



(II)

wherein

R^3 is a radical of a homo- or copolymer or combination of both of an unsaturated carboxylic acid with a statistically distributed number of COOH side groups having an acid number between 10 and 500, or the radical of a polyester having initially free COOH groups,

Me is one equivalent of an alkali or an alkaline earth metal, thus being present in its salts form, said component (C) is present in such an amount that the metal content is between 0.02 and 0.2 equivalent-%, referred to component (B), the ratio of the total epoxy equivalents of component (A) to the free COOH-groups of component (B) is between 1:5 and 5:1.

6. A process for the preparation of hardened products based on a composition as claimed in claim 1 wherein the composition is hardened at a temperature between −30° and 350° C.

4,411,956

MAGNETIC RECORDING MEDIUM

Akihiro Matsufuji; Akira Kasuga, and Hajime Miyatsuka, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 11, 1982, Ser. No. 347,810

Claims priority, application Japan, Feb. 13, 1981, 56-19904

Int. Cl.³ H01F *10/02*

U.S. Cl. 428—425.9 **11 Claims**

1. A magnetic recording medium, comprising:

a non-magnetic support base; and

a magnetic layer overlaid on a surface of said non-magnetic support base, said magnetic layer comprising ferromagnetic particles and a binder, said ferromagnetic particles being metal particles and said binder consisting essentially of (a) a nitrocellulose and (b) a polyurethane resin, wherein said nitrocellulose is selected from the group consisting of SS type nitrocellulose with a nitrogen content of 10.7–11.5% and RS type nitrocellulose with a nitrogen content of 11.5–12.2%.

4,411,957

MAGNETIC RECORDING MEDIUM

Fukunori Tokuda, and Yutaka Nakashima, both of Komoro, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

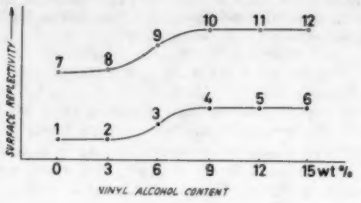
Filed Aug. 27, 1982, Ser. No. 412,164

Claims priority, application Japan, Sep. 3, 1981, 56-137727; Sep. 3, 1981, 56-137728; Sep. 18, 1981, 56-146119; Sep. 18, 1981, 56-146120

Int. Cl.³ H01F *10/02*

U.S. Cl. 428—425.9 **6 Claims**

1. A magnetic recording medium comprising a base and a magnetic coating material applied thereon, said coating being made of a binder which consists of a synthetic resin having a metal sulfonate group and a vinyl chloride-vinyl acetate copolymer containing not less than 8% vinyl alcohol on the basis



of the weight of the copolymer, and magnetic particles dispersed in said binder.

4,411,958

MAGNETIC RECORDING MEDIUM

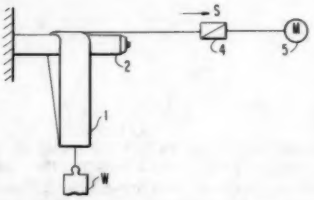
Masami Sato; Yasutoshi Okuzawa, and Noburo Hibino, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 23, 1981, Ser. No. 314,342

Claims priority, application Japan, Oct. 2[illegible]80, 55/149133

Int. Cl.³ H01F *10/00*

U.S. Cl. 428—457 **2 Claims**



1. A magnetic recording medium comprising a base, a magnetic layer formed thereon and a back coating layer on the surface of the base opposite and magnetic layer, the coefficient of friction (μ_B) of the surface opposite to the magnetic layer in transversal direction against the axial direction of loading post being under the straight line represented by the following formula, with the proviso that μ_B is less than or equal to 0.30, and the total thickness of the medium being 15.5 μm or less:

$$\mu_B = 0.1S_{TD} - 0.05$$ (wherein S_{TD} is the stiffness of the medium in transversal direction and $0.5 < S_{TD} \leq 6.0$).

4,411,959

SUBMICRON-PARTICLE DUCTILE SUPERCONDUCTOR

Aleksander I. Braginski, Pittsburgh, and Alan T. Male, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 17, 1981, Ser. No. 293,537

Int. Cl.³ H01B *12/00*

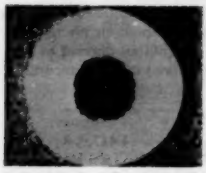
U.S. Cl. 428—558 **12 Claims**

9. A superconducting composite wire comprising:

a. an encapsulating sheath of ductile conducting metal; and

b. encapsulating filaments of essentially contiguous submicron-particle superconducting powder;

wherein said submicron-particle superconducting powder is either coated with a layer of lubricant or mixed with a lubri-



cant powder of comparable particle size, said lubricant being less than 10% by volume of said superconducting powder.

4,411,960

ARTICLES COATED WITH WEAR-RESISTANT TITANIUM COMPOUNDS

Howard Mizuhara, San Mateo, Calif., assignor to GTE Products Corporation, Stamford, Conn.

Filed Dec. 21, 1981, Ser. No. 332,429
Int. Cl.³ B22D *25/00*
U.S. Cl. 428—610 **2 Claims**

1. An article of manufacture consisting essentially of a substrate selected from ceramic and metallic substrates and a coating over at least a portion of said substrate said coating having an outer surface consisting essentially of from about 3% to about 27% nickel, from about 0 to about 24% by weight of copper and balance selected from the group consisting of titanium carbide, titanium nitride, titanium carboxynitride and mixtures thereof, an inner surface adjacent and bonded to said substrate said inner surface consisting essentially of from about 5% to about 30% by weight of nickel, from 0 to about 25% by weight of copper, balance titanium, said inner and outer surfaces having been formed from the same brazing alloy composition and a zone between said outer and inner surface containing a gradient of elemental concentration intermediate between said outer and said inner surfaces.

4,411,961

COMPOSITE ELECTROPLATED ARTICLE AND PROCESS

Robert A. Tremmel, Woodhaven, Mich., assignor to Occidental Chemical Corporation, Warren, Mich.

Filed Sep. 28, 1981, Ser. No. 305,887
Int. Cl.³ B32B *15/01*; C25D *3/04, 3/12, 3/56*
U.S. Cl. 428—613 **39 Claims**

1. A composite electroplated article comprising a body having an electrically conductive surface, an adherent first layer on said surface comprising a nickel-iron alloy having an average iron content of about 15 to about 50 percent by weight, an adherent second layer on said first layer comprising a nickel-containing plate having an average sulfur content of about 0.02 to about 0.5 percent by weight, and an adherent third layer on said second layer comprising a nickel-iron alloy having an average iron content less than that of said first layer and ranging from about 5 to about 19 percent by weight.

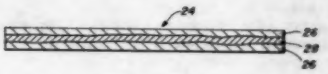
21. A process for making a composite electroplated article comprising the steps of providing a body with an electrically conductive surface, electrodepositing an adherent first layer on said surface comprising a nickel-iron alloy having an average iron content of about 15 to 50 percent by weight, electrodepositing an adherent second layer on said first layer comprising a nickel-containing plate having an average sulfur content of about 0.02 to about 0.5 percent by weight, and electrodepositing an adherent third layer on said second layer comprising a nickel-iron alloy having an average iron content less than that of said first layer and ranging from about 5 to about 19 percent by weight.

4,411,962

INDUCED OR CONSTRAINED SUPERPLASTIC LAMINATES FOR FORMING

Robert M. Johnson, Arlington, Tex., assignor to Vought Corporation, Dallas, Tex.

Filed Dec. 8, 1981, Ser. No. 328,742
Int. Cl.³ B32B *15/01*
U.S. Cl. 428—615 **24 Claims**



1. A metal laminate comprising a layer of a superplastic metal metallurgically bonded to a layer of a non-superplastic metal.

4,411,963

THIN FILM RECORDING AND METHOD OF MAKING

Harry E. Aine, 1804 Stierlin Rd., Mountain View, Calif. 94040

Division of Ser. No. 736,814, Oct. 29, 1976, Pat. No. 4,277,540, which is a continuation-in-part of Ser. No. 139,887, May 3, 1971, abandoned. This application Jul. 6, 1981, Ser. No. 280,844
Int. Cl.³ B21D *39/00*
U.S. Cl. 428—622 **22 Claims**

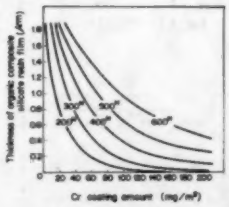
1. In a magnetic recording medium, a substrate member, a film of magnetic recording material overlaying said substrate, and a protective layer of gold and tantalum overlaying said film of magnetic recording material.

4,411,964

COMPOSITE COATING STEEL SHEETS HAVING GOOD CORROSION RESISTANCE PAINTABILITY AND CORROSION RESISTANCE AFTER PAINT COATING

Tomihiro Hara; Masahiro Ogawa; Masakazu Tsukada, and Masaaki Yamashita, all of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 17, 1981, Ser. No. 331,663
Claims priority, application Japan, Dec. 24, 1980, 55-182112
Int. Cl.³ C25D *3/04, 11/38*
U.S. Cl. 428—626 **25 Claims**



1. A composite coating steel sheet having good corrosion resistance, paintability and corrosion resistance after point coating, which consisting essentially of a plated base steel sheet, a chromate film formed on the surface of the plated base steel sheet and a composite silicate resin film formed on the chromate film and consisting essentially of a colloidal silica, an organic resin and a silane compound.

4,411,965
PROCESS FOR HIGH SPEED NICKEL AND GOLD ELECTROPLATE SYSTEM AND ARTICLE HAVING IMPROVED CORROSION RESISTANCE

Donald R. Rosegren, Cresskill, and Linda J. Mayer, Denville, both of N.J., assignors to Occidental Chemical Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 202,410, Oct. 31, 1980, abandoned. This application Aug. 16, 1982, Ser. No. 407,661
Int. Cl.³ C25D *5/12*
U.S. Cl. 428—672 **11 Claims**

1. A process for obtaining an improved corrosion-resistant gold plating on a substrate which comprises the following sequential plating steps:

(a) electrodepositing a ductile, stress-free nickel coating on said substrate from an electroplating bath containing a nickel salt, an electrolyte selected from the group consisting of boric acid, and citric acid, ortho-formyl benzene sulfonic acid, and as a wetting agent, perfluorocyclohexyl potassium sulfonate; and

(b) electrodepositing a base metal hardened gold coating on the resulting ductile, stress-free nickel plated substrate from an electroplating bath containing a gold salt, an electrolyte selected from the group consisting of acetic acid, citric acid, formic acid and mixtures thereof, and a metal salt hardener selected from the group consisting of cobalt, indium, nickel, zinc salts and mixtures thereof.

11. A substrate having formed thereon a cobalt-hardened gold/low stress nickel composite coating with improved corrosion resistance prepared by the process of claim 1.

4,411,966
MAGNETIC RECORDING MEDIUM

Nobutaka Yamaguchi; Nobuo Tsuji; Yasutoshi Okuzawa; Norio Nasu, and Masaaki Fujiyama, all of Odawara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

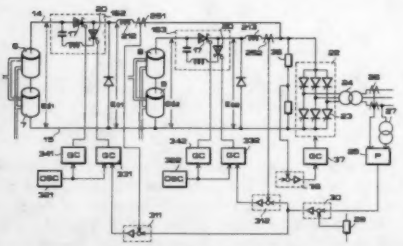
Filed Apr. 28, 1982, Ser. No. 372,686
Claims priority, application Japan, Apr. 28, 1981, 56-63377
Int. Cl.³ G11B *5/70*; H01F *10/02*
U.S. Cl. 428—695 **4 Claims**

1. A magnetic recording medium comprising a magnetic recording layer on the surface of a non-magnetic support, the magnetic recording layer comprising a ferromagnetic powder, 0.1 to 2% by weight based on the weight of the ferromagnetic powder of a saturated or unsaturated fatty acid having 6 to 22 carbon atoms, 0.01 to 1% by weight based on the weight of the ferromagnetic powder of a polysiloxane and 0.1 to 2% by weight based on the weight of the ferromagnetic powder of a fatty acid ester having a melting point of at most 60° C.

4,411,967
CELL GENERATING SYSTEM

Masao Yano, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1982, Ser. No. 368,517
Int. Cl.³ H01M *8/04*
U.S. Cl. 429—23 **3 Claims**

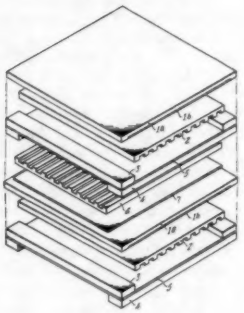


1. A generating system wherein a plurality of cells are operated in parallel with each other, which comprises each of said plurality of cells being provided with a control circuit including chopper means each composed of switching elements being ignition-controlled and each connected to the output terminal of said respective cells, and ignition circuits each generating an ignition signal for ignition-controlling said switching elements in such manner that output current of said chopper means is made to be a prescribed value in accordance with said output current.

4,411,968
MOLTEN CARBONATE FUEL CELL INTEGRAL MATRIX TAPE AND BUBBLE BARRIER

Carl A. Reiser, and Donald L. Maricle, both of Glastonbury, Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sep. 30, 1981, Ser. No. 307,338
Int. Cl.³ H01M *4/86*
U.S. Cl. 429—41 **14 Claims**



1. A matrix material for a molten carbonate fuel cell comprising a fine pore, gas permeable, anode stable metal layer having about 25% to about 35% by volume porosity bonded to a matrix tape, the matrix tape comprising a mixture of particles inert to molten carbonate electrolyte having a particle size less than about 1 micron, ceramic particles having a particle size greater than about 25 microns, and an organic polymeric binder material, the binder material being present in an amount at least about 25% by volume, the matrix tape being flexible, pliable, and compliant at room temperature.

8. A molten carbonate fuel cell containing an anode section, a cathode section, a matrix and electrolyte, wherein the improvement comprises as the matrix a fine pore, gas permeable, anode stable metal layer having about 25% to about 35% by volume porosity bonded to a matrix tape, the matrix tape comprising a mixture of particles inert to molten carbonate electrolyte having a particle size less than about 1 micron, ceramic particles having a particle size greater than about 25 microns, and an organic polymeric binder material, the binder material being present in an amount at least about 25% by volume, the matrix tape being flexible, pliable and compliant at room temperature.

4,411,969
BATTERY CONSTRUCTION CHARACTERIZED BY REACTIVELY LIMITED GRIDLESS ELECTRODE MEANS, AND METHODS OF MAKING AND OPERATING SAME

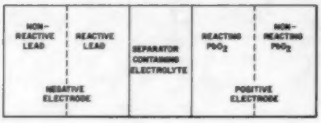
Erik G. Sundberg, Newtown, Pa., assignor to Koehler Manufacturing Company, Marlborough, Mass.

Filed May 6, 1981, Ser. No. 261,282
Int. Cl.³ H01M *10/06*
U.S. Cl. 429—50 **19 Claims**

1. A lead-acid battery construction including positive and

negative electrode means supported in contact with separator means in which is contained an electrolyte,

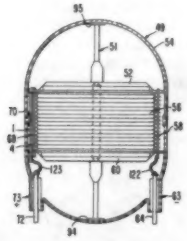
characterized in that the positive and negative electrode means are free from grid structure and reactively limited and further characterized in that the negative electrode means is provided with reactive and non-reactive lead portions which determine and limit dimensional characteristics of reacting and non-reacting PbO_2 portions of the positive electrode means, the non-reacting PbO_2 portions of the positive electrode means and the reactive lead portions of the negative electrode means arranged in series and being of a mass operative to function as sole means for conducting a required electrical current into and out of the electrode means.



4,411,970
EQUALIZING BATTERY CELL BUSBAR

Theodore O. Meyer, Sunnyvale, and Gerrit van Ommering, San Francisco, both of Calif., assignors to Ford Aerospace & Communications Corporation, Detroit, Mich.

Filed Nov. 16, 1981, Ser. No. 321,514
Int. Cl.³ H01M *2/26*
U.S. Cl. 429—161 **6 Claims**



1. A battery cell comprising:

an electrode stack comprising at least two electrode modules, each module having at least one positive and one negative electrode;

a conductive positive terminal coupled to each of said positive electrodes;

a conductive negative terminal coupled to each of said negative electrodes; and

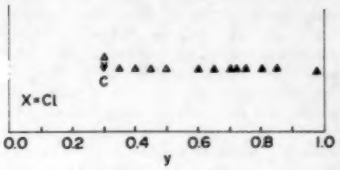
a conductive equalizing busbar coupled between only one of said terminals and said electrodes of the same polarity as the terminal to which said equalizing busbar is coupled, wherein said equalizing busbar tends to equalize the resistance in each path that comprises both terminals and one module;

wherein said cell has two opposing ends, and each of said terminals protrudes into said cell at the same end.

4,411,971
LITHIUM COMPOUNDS

Akira Gotoh, Fuchu; Hidehito Obayashi, Tokyo; Ryo Nagai, Nara; Shouji Mochizuki, Suita, and Tetsuichi Kudo, Tokyo, all of Japan, assignors to Hitachi Maxell, Ltd., Japan

Filed Apr. 26, 1982, Ser. No. 371,798
Claims priority, application Japan, Apr. 27, 1981, 56/62381
Int. Cl.³ H01M *6/18*
U.S. Cl. 429—191 **15 Claims**



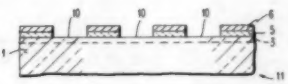
1. A lithium compound composed of a lithium halide and lithium imide.

11. A cell comprising a lithium ionic conductive solid electrolyte with electrodes provided repsectively on both sides thereof, said solid electrolyte consisting of a lithium compound which is composed of a lithium halide and lithium imide.

4,411,972
INTEGRATED CIRCUIT PHOTOMASK

Bernt Narken, Poughkeepsie, and Henry C. Schick, Hopewell Junction, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1981, Ser. No. 336,005
Int. Cl.³ B32B *3/00, 7/00*; G03F *7/00*
U.S. Cl. 430—5 **25 Claims**



1. A photomask comprised of a transparent dielectric having a tin or tin-indium doped conductive zone therein coextensive with a surface thereof and a minimum transmittance of about 95%; and a mask on said surface and having a predetermined pattern of opaque extensions delineating a desired pattern of complementary transparent areas through said substrate.

4,411,973
ELEMENTS CONTAINING ORDERED WALL ARRAYS AND PROCESSES FOR THEIR FABRICATION

Hugh S. A. Gilmour, Rochester, and Richard N. Blazey, Penfield, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 196,947, Oct. 14, 1980, abandoned. This application Aug. 17, 1981, Ser. No. 293,080
Int. Cl.³ G03G *13/22*; G03C *5/00, 7/12*
U.S. Cl. 430—7 **70 Claims**

63. In a process of producing an element useful in multicolor photography comprising

forming support means areally extended along an axial plane comprised of bottom wall portions and lateral wall portions cooperating to form an array of microcells and

sequentially positioning first, second, and third imaging compositions in first, second, and third interlaid sets of microcells, respectively, the first, second, and third imaging compositions being chosen from among compositions

each responsive to or useful in absorbing light in a different protion of the visible spectrum,

the improvement comprising

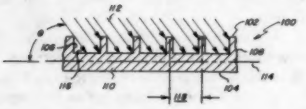
in forming the microcells, differentiating the microcells of each set from the microcells of the remaining sets in at least one of depth, lateral extent along the axial plane, and orientation,

positioning a radiation-sensitive material in the microcells,

directing radiation toward the support means at an acute angle with respect to the axial plane to impinge a portion of the radiation on the radiation-sensitive material in the first set of the microcells while a remaining portion of the radiation is interrupted by the lateral wall portions to entirely shadow the radiation-sensitive material in the second and third sets of microcells,

visibly differentiating the first set of microcells from the second and third sets of microcells as a function of exposure of the radiation-sensitive material,

selectively positioning the first imaging composition on the exposed bottom walls of the support in the first set of microcells,



directing radiation toward the support means at an acute angle with respect to the axial plane to impinge a portion of the radiation on the radiation-sensitive material in the second set of microcells while a remaining portion of the radiation is interrupted by the lateral walls to entirely shadow the radiation-sensitive material in the third set of microcells,

visibly differentiating the second set of microcells from the third set of microcells as a function of exposure of the radiation-sensitive material, and

selectively positioning the second imaging composition on the exposed bottom walls of the support in the second set of microcells.

64. The improved process according to claim **63**, wherein radiation is subsequently directed toward the support means substantially perpendicular to the axial plane to expose the bottom walls of the third set of microcells and selectively positioning the third imaging composition on the exposed bottom walls of the support in the third set of microcells.

67. The improved process according to claim **58**, **59**, **60**, **61**, **62**, **63**, and **64**, wherein the first, second, and third compositions are each coprised of a subtractive primary dye or dye precursor.

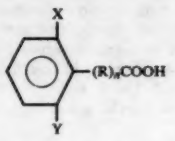
4,411,974

ORTHO-HALO PHENYL CARBOXYLIC ACID CHARGE ENHANCING ADDITIVES

Chin H. Lu, Webster; Christopher J. Au Clair, Fairport, and Peter F. Erhardt, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 12, 1982, Ser. No. 367,193
Int. Cl.³ G03G 9/08
U.S. Cl. 430—106 **33 Claims**

1. A dry negatively charged toner composition comprised of resin particles, and pigment particles, and from about 0.1 to about 10 weight percent of an ortho-halo phenyl carboxylic acid charge enhancing additive of the formula:



wherein X is halogen, Y is hydrogen or halogen, R is an alkylene group of from 1 to about 3 carbon atoms, and n is the number zero (0) or 1.

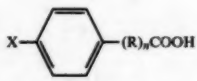
4,411,975

PARA-HALO PHENYL CARBOXYLIC ACID CHARGE ENHANCING ADDITIVES

Chin H. Lu, Webster, and Christopher J. Au Clair, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Apr. 12, 1982, Ser. No. 367,194
Int. Cl.³ G03G 9/08
U.S. Cl. 430—106 **21 Claims**

1. A dry positively charged toner composition comprised of resin particles and pigment particles, and from about 0.1 percent to about 10 percent based on the weight of the toner particles, a para-halo phenyl carboxylic acid charge enhancing additive of the formula:



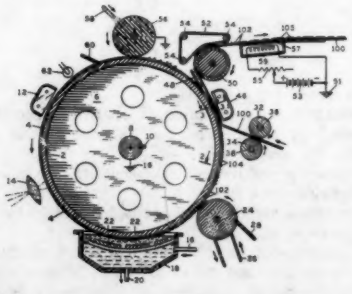
wherein X is a halogen, R is an alkylene group containing from about 1 to about 3 carbon atoms, and n is the number zero or 1.

4,411,976

METHOD OF INCREASING THE DENSITY OF LIQUID-DEVELOPED GAP-TRANSFERRED ELECTROPHOTOGRAPHIC IMAGES AND DEVELOPING COMPOSITION FOR USE THEREIN

Benzion Landa, Edmonton, Canada, and E. Paul Charlap, Larchmont, N.Y., assignors to Savin Corporation, Valhalla, N.Y.

Continuation-in-part of Ser. No. 338,006, Jan. 8, 1982. This application Jan. 11, 1982, Ser. No. 338,519
Int. Cl.³ G03G 9/12
U.S. Cl. 430—114 **5 Claims**



1. In a method of electrophotography in which a latent electrostatic image is formed on a photoconductive surface, the latent image is developed on said surface with toner particles comprising a polymer dispersed in a carrier liquid, said

polymer being substantially insoluble in said carrier liquid at ambient temperatures and solvatable in said carrier liquid at an elevated temperature, and in which the developed image is transferred across a gap to a sheet positioned a predetermined distance from the photoconductive surface, the improvement which comprises heating said gap-transferred image to an elevated temperature sufficient to solvate a substantial portion of said polymer in said carrier liquid associated with said transferred image whereby rapidly to increase the density of the transferred image.

4,411,977
TONER IMAGE TRANSFER TO MULTILAYER INTERMEDIATE TRANSFER BODY

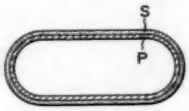
Noriyoshi Tarumi, Hachioji; Kiyoshi Kimura, Iruma, and Tadashi Miwa, Kunitachi, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1982, Ser. No. 403,357

Claims priority, application Japan, Aug. 14, 1981, 56-126813

Int. Cl.³ G03G *13/16*

U.S. Cl. 430—126 **7 Claims**



1. An image forming process comprising, forming an electrostatic latent image on the surface of an image retaining member, visualizing said electrostatic latent image to a toner image, bringing said toner image into contact with an intermediate transfer body which comprises a substrate consisting of a thermoplastic resin layer and a thermosetting resin layer, and transferring said toner image on the surface of said intermediate transfer body to a recording medium.

4,411,978
PHOTORESIST MATERIALS AND PROCESSES OF USING WITH PHOTOSENSITIVE NAPHTHOQUINONE DIAZIDES AND NITRONES

Urbain L. Laridon, Wilrijk; Hendrik E. Kokelenberg, Merksem, and Rafaël P. Samijn, Hoboken, all of Belgium, assignors to AGFA-Gevaert N.V., Mortsel, Belgium

Filed Mar. 13, 1978, Ser. No. 885,998

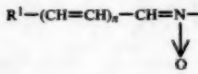
Claims priority, application United Kingdom, Mar. 15, 1977, 10903/77

Int. Cl.³ G03C *1/54, 1/60, 1/72, 5/00*

U.S. Cl. 430—157 **15 Claims**

1. A photosensitive recording material which comprises a supported layer containing a mixture of photosensitive substances in admixture with at least one polymer that is soluble in an alkaline aqueous liquid, characterized in that said mixture of photosensitive substances consists essentially of:

(A) at least one negative-working photosensitive nitrone of the formula:



in which:

R is an aromatic hydrocarbon group

R^1 is an aromatic or heterocyclic group,

n represents zero or 1, and

(B) at least one positive-working photosensitive naphthoquinone(1,2)-diazide (2) compound, having a higher ultraviolet absorption in the wavelength range of 350 to 400 nm and a higher visible light absorption above 400 nm than each such nitrone has, said (A) and (B) compounds being present in such relative quantities to each other that the layer exhibits a relative decrease in solubility in an alkaline aqueous liquid upon a sufficient exposure to a UV-light and a relative increase in solubility in an alkaline aqueous liquid upon a lesser exposure to visible light or to UV-light.

14. A method for producing a positive photoresist comprising the steps of:

(1) information-wise exposing the photosensitive layer of the material according to claim 1 to ultraviolet radiation and/or visible light of a dose sufficient to increase the solubility of the exposed portions by phototransformation of the naphthoquinone-(1,2)-diazide(2) compound without substantially affecting the nitrone, and

(2) overall contacting the exposed photosensitive layer with an aqueous alkaline liquid to remove selectively the exposed portions of the photosensitive layer.

15. A method for producing a negative photoresist comprising the steps of:

(1) information-wise exposing the photosensitive layer of the material according to claim 1 to ultraviolet radiation of a dose sufficient to decrease the solubility of the exposed portions by the photoproducts of the nitrone which are formed by such exposure in a higher amount than are the photoproducts of the naphthoquinone-(1,2)-diazide(2) compound(s),

(2) overall exposing the photosensitive layer to ultraviolet radiation and/or visible light of a dose substantially less than that of step 1 but sufficient to improve the solubility of the initially non-exposed portions, and

(3) overall contacting the exposed photosensitive layer with an aqueous alkaline liquid to remove selectively the initially non-exposed portions of the photosensitive layer.

4,411,979
DIAZO TYPE THERMOSENSITIVE RECORDING MATERIAL

Masanaka Nagamoto, Shizuoka; Yoshihiro Koseki, Numazu, and Susumu Iwata, Shizuoka, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

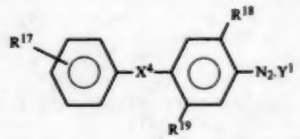
Filed Jan. 6, 1982, Ser. No. 337,334

Claims priority, application Japan, Jan. 28, 1981, 56-11186

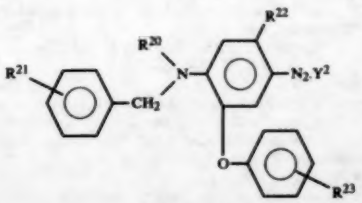
Int. Cl.³ G03C *1/54, 1/60*

U.S. Cl. 430—176 **18 Claims**

1. A diazotype thermosensitive recording material, comprising: a support material and a thermosensitive recording layer formed thereon, said thermosensitive recording layer comprising (a) a diazonium compound selected from the group consisting of diazonium compounds having the formulas (IV) and (V):



(IV)

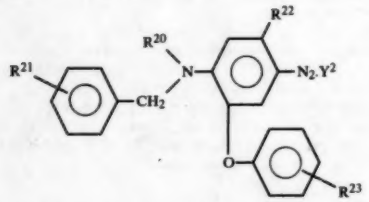


(V)

wherein R^{17}, R^{18}, R^{19}, R^{21}, R^{22} and R^{23} each is hydrogen, lower alkyl, lower alkoxy or halogen, R^{20} is hydrogen, lower

alkyl or lower alkoxy; R^4 is sulfur or oxygen; and Y^1 and Y^2 each represent a halogen ion, a fluorine-containing ion, or an acidic residue forming a double salt, in combination with a metallic salt, (b) a coupler consisting essentially of phloroglucinol, (c) a thermo-fusible or thermo-softening, film-forming binder and (d) a thermo-fusible material capable of promoting fusing said layer when heat is applied thereto to effect a speedy coloring reaction between said diazonium compound and said coupler, the weight ratio of said diazonium compound to said thermo-fusible material being in the range of 1:2 to 1:30, said thermosensitive recording layer has been formed by drying on said support, a dispersion comprising said diazonium compound, said coupler, said thermo-fusible or thermo-softening binder, said thermo-fusible material, and a solvent in which said diazo compound and said coupler are substantially insoluble, so that both said diazonium compound and said coupler exist as unconsecutive particles in said thermosensitive recording layer.

9. A diazotype thermosensitive recording material comprising a support material and a thermosensitive recording layer formed thereon, said thermosensitive recording layer comprising (a) a diazonium compound selected from the group consisting of diazonium compounds having the formula:



wherein R^{21}, R^{22} and R^{23} each is hydrogen, lower alkyl, lower alkoxy or halogen; R^{20} is hydrogen, lower alkyl or lower alkoxy and Y^2 represents a halogen ion, a fluorine-containing ion, or an acidic residue forming a double salt, in combination with a metallic salt, (b) a coupler, (c) a thermo-fusible or thermo-softening, film-forming binder and (d) a thermo-fusible material capable of promoting fusing said layer when heat is applied thereto to effect a speedy coloring reaction between said diazonium compound and said coupler, the weight ratio of said diazonium compound to said thermo-fusible material being in the range of 1:2 to 1:30, said thermosensitive recording layer has been formed by drying on said support a dispersion comprising said diazonium compound, said coupler, said thermo-fusible or thermo-softening binder, said thermo-fusible material, and a solvent in which said diazo compound and said coupler are substantially insoluble, so that both said diazonium compound and said coupler exist as unconsecutive particles in said thermosensitive recording layer.

4,411,980

PROCESS FOR THE PREPARATION OF FLEXIBLE CIRCUITS

Douglas M. Haney, Hockessin, Del., and John W. Lott, Tinton Falls, N.J., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sep. 21, 1981, Ser. No. 304,107
Int. Cl.³ G03C *5/24*
U.S. Cl. 430—291 **17 Claims**

1. A process for the preparation of flexible circuits formed from a flexible photohardenable element which comprises:
(a) exposing imagewise to actinic radiation the flexible photohardenable element comprising, in order,
(1) a flexible support,
(2) a dry, tacky photohardenable layer comprising a photohardenable composition, including at least one organic elastomeric polymeric binder compound, and, optionally,
(3) a removable cover sheet;
(b) removing the cover sheet, if present, and applying particulate metal to the unexposed image areas of the photohardenable layer; optionally
(c) heating the element to a temperature in the range of 25° C. to 80° C.; then
(d) removing excess particulate metal; optionally,
(e) fixing or binding the particulate metal to the photohardenable layer by heating, curing by exposing to actinic radiation, embedding mechanically, and combinations thereof; and
(f) plating electrolessly or soldering the particulate metal bearing or metal containing areas thereby forming an electrically conductive flexible circuit, said electrically conductive flexible circuit when having a thickness of 0.001" can be repeatedly bent around a structure having a diameter of 0.600" without breaking, cracking or delaminating, said electrically conductive flexible circuit when having thicknesses different from 0.001" the diameter of said structure would be increased or decreased proportionally with the proviso that the minimum diameter of said structure would always be greater than 0.25".

4,411,981

METHOD FOR FORMING A PATTERN IN A THIN-FILM TRANSISTOR HAVING TELLURIUM SEMICONDUCTOR LAYER

Shigehiro Minezaki, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Feb. 25, 1981, Ser. No. 238,102
Claims priority, application Japan, Feb. 28, 1980, 55-24888
Int. Cl.³ C23F *1/02*; G03C *5/00*; H01L *21/00*
U.S. Cl. 430—299 **26 Claims**

1. A method for making a patterned tellurium semiconductor layer, comprising the steps of:
depositing a tellurium semiconductor layer on a substrate;
forming a photoresist layer, selected portions of said photoresist layer being soluble upon exposure to actinic radiation in an aqueous basic developing and etching solution consisting essentially of an effective amount of compounds selected from the group consisting of inorganic hydroxides, silicates, phosphates, organic bases, monobasic strong bases, water soluble basic amines, water soluble alcohols and mixtures thereof;
soft baking the substrate having both the tellurium and photoresist layer thereon;
exposing selected portions of the photoresist to actinic radiation to form a pattern in the photoresist;
contacting the thus exposed device with said aqueous basic developing and etching solution to selectively remove the exposed portions of said photoresist and to selectively etch the corresponding portions of said tellurium semiconductor layer;
washing the resultant device; and
contacting the remaining resist layer with an organic solvent to remove the remaining resist layer.

9. A method for making a thin-film transistor, comprising the steps of:
forming a source electrode, a drain electrode, a gate electrode and a tellurium semiconductor layer, wherein the tellurium semiconductor layer is made by a process consisting essentially of the following steps:
depositing a tellurium semiconductor layer on a substrate;
forming a photoresist layer, selected portions of said photoresist layer being soluble upon exposure to ultraviolet light in an aqueous basic developing and etching solution consisting essentially of an effective amount of compounds selected from the group consisting of inorganic hydroxides, silicates, phosphates, organic bases, monobasic strong bases, water soluble basic amines, water soluble alcohols and mixtures thereof;
soft baking the substrate having both the tellurium and photoresist layer thereon;

exposing selected portions of the photoresist to ultraviolet light to form a pattern in the photoresist;

contacting the thus exposed device with said aqueous basic developing and etching solution to selectively remove the exposed portions of said photoresist and to selectively etch the corresponding portions of said tellurium semiconductor layer;

washing the resultant device; and

contacting the remaining resist layer with an organic solvent to remove the remaining resist layer.

4,411,982

METHOD OF MAKING FLEXIBLE PRINTED CIRCUITS

Chuji Shibuya, Katano; Satoshi Kaneda, Takatsuki; Takashi Kanehisa, Osaka; Masatoshi Kondo, Hirakata; Kenji Nogawa, Izumi, and Fumio Hasuike, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 188,666, Sep. 19, 1980, abandoned. This application Jan. 12, 1982, Ser. No. 338,907

Claims priority, application Japan, Sep. 26, 1979, 54-124615

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—314 **9 Claims**

1. In a method of making a flexible printed circuit wherein:

(a) a flexible belt-like substrate strip of an insulating polymer resin film is provided with a layer of electrically conductive metal foil bonded on at least one face and is punched with a plurality of through holes;

(b) a photopolymer film is formed on said layer of electrically conductive metal foil;

(c) the photopolymer film is exposed in a predetermined pattern;

(d) the photopolymer film is developed and is thereby removed according to said pattern;

(e) the foil on the substrate, where it is now bare of photopolymer film in certain areas as a result of conducting step (d), is subjected to an etchant, for removing said layer of electrically conductive metal foil where it has thus been bared;

(f) the photopolymer film is removed from where it remains in place upon the remaining pattern of electrically conductive metal foil that is to become electrical circuitry; and

(g) a solder resist layer is formed on selected portions of the thus-bared pattern of electrically conductive metal foil that is to become electrical circuitry,

an improvement for overcoming a problem which arises where the substrate strip of insulating polymeric resin film is subject to longitudinal shrinkage during processing subsequent to the conducting of step (a), in that, in conducting step (g), said selected portions where said solder resist layer is formed are inaccurately located relative to said through holes or said pattern of electrically conductive metal foil that is to become electrical circuitry,

said improvement comprising:

in conducting step (e) there is left on said substrate strip of insulating polymer resin, at least one long, narrow band of said layer of electrically conductive metal in a substantially non-etched condition, of which each such band lies near and extends parallel to a respective lateral extreme of said belt-like strip of insulating polymer resin and adjacent, but separate from and laterally outside said pattern of electrically conductive metal foil that is to become electrical circuitry, so that said at least one band is available at least until the completion of the conducting of step (g), to prevent inaccurate location of said selected portions where said solder resist layer is formed by preventing longitudinal polymer film of said substrate,

said at least one band being formed so as to be on the order of as long as said pattern of electrically conductive metal foil that is to become electrical circuitry, at least to the extent that said pattern of electrically conductive metal is to become one flexible printed circuit.

4,411,983

METHOD FOR PROCESSING AN IMAGE-FORMING MATERIAL

Yasuo Washizawa; Fumiaki Shinozaki; Tomoaki Ikeda, all of Asaka, and Sho Nakao, Shizuoka, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 228,506, Jan. 26, 1981, abandoned, which is a continuation of Ser. No. 33,071, Apr. 25, 1979, abandoned. This application Mar. 11, 1982, Ser. No. 357,114

Claims priority, application Japan, Apr. 25, 1978, 53/48837

Int. Cl.³ G03C *5/00*

U.S. Cl. 430—325 **3 Claims**

1. In a method of processing an image-forming material comprising a support having thereon an alkaline solution developable light-sensitive resin composition layer developable by fall-off development including image-wise exposure followed by contact with an alkaline developer solution and mechanical abrasion, the improvement which comprises said method comprising the sequential steps of

(1) imagewise exposing said image-forming material,

(2) contacting said image-wise exposed image-forming material obtained in (1) with said alkaline developer solution, and

(3) subsequently treating the developer solution-contacted image-forming material obtained in (2) with

a mixture of water and an organic solvent miscible with water in a volume ratio of water to organic solvent of 100:0.2 to 100:10, said organic solvent being selected from the group consisting of ethylene glycol monophenyl ether, benzyl alcohol, ethylene glycol monobutyl ether, ethylene glycol monoethyl ether, ethylene glycol monomethyl ether and diethylene glycol monomethyl ether.

4,411,984

DYE PRECURSORS AND THEIR USE IN PHOTOGRAPHIC MATERIALS AND PROCESSES

Rolf S. Gabrielsen, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed May 3, 1982, Ser. No. 373,915

Int. Cl.³ G03C *5/24, 1/02*

U.S. Cl. 430—351 **29 Claims**

1. In a photographic element comprising a support having thereon, in reactive association, in binder, photographic silver halide and a dye precursor, the improvement wherein,

said dye precursor is a diphenylamine having, in an ortho position to the amine, a sulfonyldiamido group that is capable upon oxidation of said diphenylamine of releasing a sulfonylamine fragment which, in turn, is capable of thermally releasing ammonia or an amine and wherein said diphenylamine is capable upon oxidation of forming a phenazine dye.

4,411,985

HEAT STABILIZABLE PHOTOGRAPHIC SILVER HALIDE MATERIAL AND PROCESS

Lawrence R. Morrow, Richmond, Tex., and John Thatcher, Webster, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

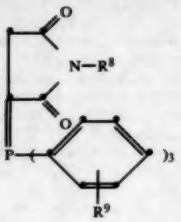
Filed Sep. 17, 1981, Ser. No. 303,314

Int. Cl.³ G03C *1/02, 5/24*

U.S. Cl. 430—352 **63 Claims**

1. In a heat stabilizable photographic silver halide element comprising a support having thereon, in binder, in reactive association, (a) photographic silver halide, and (b) a silver halide stabilizer precursor, the improvement comprising:

as said stabilizer precursor, a silver halide stabilizing concentration of a phosphorane represented by the formula:



wherein:

R^8 is hydrogen, alkyl containing 1 to 20 carbon atoms or aryl containing 6 to 12 carbon atoms; and

R^9 is hydrogen or alkyl containing 1 to 3 carbon atoms.

4,411,986

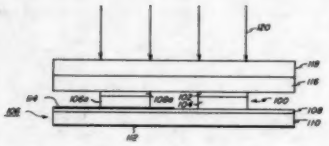
RADIOGRAPHIC ELEMENTS EXHIBITING REDUCED CROSSOVER

Thomas I. Abbott, Rochester, and Cynthia Jones, Bergen, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 320,907, Nov. 12, 1981, abandoned. This application Sep. 30, 1982, Ser. No. 430,222

Int. Cl.³ G03C *1/76*

U.S. Cl. 430—502 **20 Claims**



1. In a radiographic element comprised of

first and second imaging means,

at least said first imaging means including a silver halide emulsion comprised of a dispersing medium and radiation-sensitive silver halide grains, and

a support interposed between said imaging means capable of transmitting radiation to which said second imaging means is responsive

the improvement comprising said first imaging means containing

tabular silver halide grains having a thickness of less than 0.3 micron, a diameter of at least 0.6 micron, and an average aspect ratio of greater than 8:1 accounting for at least 50 percent of the total projected area of said silver halide grains present in said silver halide emulsion and

spectral sensitizing dye adsorbed to the surface of said tubular silver halide grains in an amount sufficient to substantially optimally sensitize said tubular grains.

4,411,987

SILVER HALIDE COLOR PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL

Hidetoshi Kobayashi; Toshiyuki Watanabe; Keiichi Adachi, and Tadashi Ogawa, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 8, 1982, Ser. No. 440,044

Claims priority, application Japan, Nov. 6, 1981, 56-177989

Int. Cl.³ G03C *1/02, 1/40*

U.S. Cl. 430—542 **38 Claims**

1. A silver halide color photographic light-sensitive material comprising a support having thereon at least one silver halide emulsion layer wherein the photographic light-sensitive material contains one or more unsubstituted or substituted glycoluril compounds.

4,411,988

PROCESS FOR THE DETERMINATION OF ANTI-HYALURONIDASE AND AN AGENT SUITABLE FOR THIS PURPOSE

Tibor Toth, Marburg, and Reiner Gils, Schwalmstadt, both of Fed. Rep. of Germany, assignors to Behringwerke A.G., Marburg, Fed. Rep. of Germany

Continuation of Ser. No. 139,456, Apr. 11, 1980, abandoned. This application Jan. 26, 1982, Ser. No. 342,824

Claims priority, application Fed. Rep. of Germany, Apr. 14, 1979, 2915309

Int. Cl.³ G01N *33/54*; C12Q *1/00, 1/34, 1/14*

U.S. Cl. 435—7 **4 Claims**

1. A method for determining anti-hyaluronidase in an aqueous solution thereof, which comprises first reacting a defined amount of streptococcal hyaluronidase with a dilution series of said aqueous solution of anti-hyaluronidase, adding a defined amount of hyaluronic acid to said dilution series, and then adding a mixture of 10 parts by weight of cetyl trimethyl ammonium halide with from 1 to 10 parts by weight of a dis-azo dyestuff to said dilution series to precipitate the hyaluronic acid not decomposed by streptococcal hyaluronidase, and determining the limiting concentration for which a precipitate forms.

3. A test kit for determining anti-hyaluronidase in an aqueous solution thereof, said kit comprising:

(a) human serum containing a defined concentration of anti-hyaluronidase, for use as a reference standard;

(b) streptococcal hyaluronidase for addition to said reference standard and the aqueous test solution to be tested for reaction with anti-hyaluronidase present in said standard and test solution.

(c) a hyaluronic acid substrate consisting of a mixture of hyaluronic acid and glycine for subsequent addition to said reference standard and test solution for reaction with excess unreacted hyaluronidase present therein; and

(d) a dyestuff reagent comprising 10 parts by weight of a cetyl trimethyl ammonium halide with from 1 to 10 parts by weight of a dis-azo dyestuff for further subsequent addition to said reference standard and test solution for the visually detectable precipitation of excess unreacted hyaluronic acid present therein, wherein (a), (b), (c), and (d) are present in amounts sufficient to perform the method of claim 1.

4,411,989

PROCESSES AND DEVICES FOR DETECTION OF SUBSTANCES SUCH AS ENZYME INHIBITORS

Ann E. Grow, Kansas City, Mo., assignor to Midwest Research Institute, Kansas City, Mo.

Filed Aug. 13, 1981, Ser. No. 292,611

Int. Cl.³ C12N *9/12, 9/18, 9/76, 11/00*; C12Q *1/46, 1/48, 1/38*; C12M *1/34*

U.S. Cl. 435—20 **9 Claims**

1. A method for detecting the presence in a fluid medium of an inhibitor capable of combining with an enzyme, comprising the steps of:

(a) collecting a sample of said inhibitor in said fluid medium by bringing said fluid medium into contact with substantially uncombined enzyme, thereby forming an enzyme-inhibitor combination; and

(b) detecting any infrared wave-energy interaction characteristic of said enzyme-inhibitor combination, which differs, at a given infrared wavelength, from the infrared wave-energy interaction characteristic of the substantially uncombined enzyme at said wavelength, said detecting step including the measurement of the percent transmission of infrared energy of the enzyme-inhibitor combina-

tion at the given wavelength, the percent transmission of infrared energy of the substantially uncombined enzyme at said wavelength being known.

4,411,990

PRIMARY BIOASSAY OF HUMAN TUMOR STEM CELLS

Sydney E. Salmon, Tucson, Ariz., and Anne W. Hamburger, Potomac, Md., assignors to University Patents, Inc., Norwalk, Conn.

Continuation of Ser. No. 48,190, Jun. 13, 1979, abandoned, which is a continuation of Ser. No. 922,722, Jul. 7, 1978, abandoned. This application Apr. 15, 1981, Ser. No. 254,346

Int. Cl.³ C12Q 1/18, 1/00; C12O 1/29

U.S. Cl. 435—32 25 Claims

1. An in vitro method for quantitatively assaying for the viable colony-forming tumor stem cell content of a sepcimen of primary explanted cells obtained from primary or metastatic human tumors employing a two-layer culture system exhibiting interlayer diffusibility of dissolved nutrients and growth factors, comprising the steps of:

(a) forming a cell-free gelled underlayer comprising a liquid tissue culture feeder nutrient medium capable of supporting human tumor cell growth and a gelling agent for said feeder nutrient medium;

(b) preparing a gelable liquid single-cell suspension of said explanted cells in a liquid tissue culture carrier nutrient medium capable of supporting human tumor cell growth and containing a gelling agent for said carrier nutrient medium;

(c) plating said suspension onto said underlayer and allowing gelation thereof to occur, thereby forming a gelled overlayer which contains a known quantity of said explanted cells and which together with said underlayer constitutes said two-layer culture system, said culture system further containing a tumor stem cell colony growth-promoting concentration of METGF dissolved within at least one of said two layers, said METGF being a water-soluble tumor growth factor which is elaborated by macrophages;

(d) incubating said culture system for a period of time sufficient to grow tumor stem cell colonies, the concentration of said explanted cells in said suspension being within a range enabling a substantially proportional relationship to exist between the total number of said explanted cells present in said overlayer and the total number of resulting tumor stem cell colonies grown during said incubation period; and

(e) measuring the viable colony-forming tumor stem cell content of said overlayer as the total number of resulting tumor stem cell colonies grown during said incubation period.

4,411,991

PROCESS FOR FERMENTATIVE PRODUCTION OF AMINO ACIDS

Kan Hirakawa, Takasago; Ryoji Takakuma, Kakogawa; Koji Nomura, Takasago; Masami Katoh, and Kiyoshi Watanabe, both of Akashi, all of Japan, assignors to Kanegafuchi Chemical Industry Company, Limited, Osaka, Japan

Filed Sep. 17, 1981, Ser. No. 302,996

Claims priority, application Japan, Oct. 7, 1980, 55-140818; Apr. 9, 1981, 56-54127; Apr. 21, 1981, 56-60098; Jun. 16, 1981, 56-93130

Int. Cl.³ C12P 39/00, 13/04, 13/22, 13/20, 13/14, 13/08, 13/06; C12R 1/13, 1/15, 1/225, 1/285, 1/365, 1/46

U.S. Cl. 435—42 18 Claims

1. In a process for producing an amino acid by mixed-cultivating microorganisms in an aqueous nutrient medium containing one or more carbohydrates, accumulating an amino acid in the resultant culture broth, and recovering the amino acid from the culture broth, the improvement comprising aerobically mixed-cultivating an amino acid-producing microorganism having an ability of assimilating lactic acid, but having no or a weak ability of assimilating at least one carbohydrate in the nutrient medium, and at least one lactic acid-producing microorganism having an ability of assimilating the carbohydrate which is nonassimilable or weakly assimilable by said amino acid-producing microorganism, whereby an amino acid is produced from the carbohydrate in one step operation.

4,411,992

PROCESS FOR PREPARING MURINE INTERLEUKIN 2

Steven Gillis, Woodinville, Wash., assignor to Immunex Corporation, Seattle, Wash.

Filed Apr. 14, 1981, Ser. No. 249,906

Int. Cl.³ C12P 21/00, 1/00, 21/02; C12N 5/00, 5/02; C12R 1/91; A61K 37/00

U.S. Cl. 435—68 25 Claims

1. A process for the production of IL-2 from a murine malignant T-cell line, comprising culturing malignant murine T-cells in a culture medium containing a T-cell mitogen, and recovering the IL-2 from the culture medium.

4,411,993

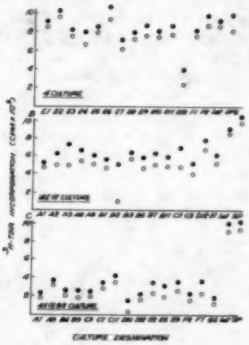
HYBRIDOMA ANTIBODY WHICH INHIBITS INTERLEUKIN 2 ACTIVITY

Steven Gillis, 15509 NE. 198th, Woodinville, Wash. 98072

Filed Apr. 29, 1981, Ser. No. 258,601

Int. Cl.³ C12P 21/00; C12N 5/00, 5/02, 1/00; C12P 1/00, 21/02; C12R 1/91; A61K 39/00

U.S. Cl. 435—68 69 Claims



1. A process for producing a hybridoma antibody which inhibits IL-2 activity, comprising:

immunizing murine B-lymphocyte cells with IL-2;

activating said immunized murine B-lymphocyte cells with a B-cell mitogen;

fusing said activated murine B-lymphocyte cells with murine myeloma cells to form hybridoma anti-IL-2 antibody producing cells

cultivating said anti-IL-2 antibody producing cells; and

recovering the anti-IL-2 antibody produced by said anti-IL-2 antibody producing cells.

4,411,994

PROTEIN SYNTHESIS

Walter Gilbert; Stephanie A. Broome, both of Cambridge; Lydia J. Villa-Komaroff, Boston, and Argiris A. Efstratiadis, Cambridge, all of Mass., assignors to The President and Fellows of Harvard College, Cambridge, Mass.

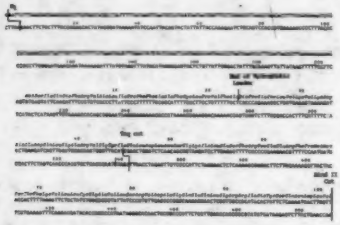
Filed Jun. 8, 1978, Ser. No. 913,533

Int. Cl.³ C12P 21/04, 21/00; C12N 15/00, 1/00

U.S. Cl. 435—71 5 Claims

1. The method of making within a bacterial host and excret-

ing through the membrane of the host cell a selected protein or polypeptide which comprises cleaving a bacterial gene for an extracellular or periplasmic carrier protein, within a cloning vehicle selected from the group comprising plasmids or phage genes, forming a hybrid gene by inserting into that cleavage



site a non-bacterial DNA fragment which codes for the selected protein or polypeptide, transforming said bacterial host with the hybrid gene, and culturing the transformed bacteria to express the hybrid gene and excrete the selected protein or polypeptide.

4,411,995

SYNTHESIS OF NICOTINAMIDE COFACTORS

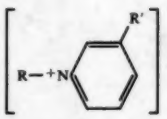
George Whitesides, Newton, and Davis R. Walt, Brookline, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Sep. 28, 1981, Ser. No. 306,460
Int. Cl.³ C12P *19/36*; C12N *11/08*; C07H *15/12, 19/00*
U.S. Cl. 435—90 **11 Claims**

1. A method of preparing nicotinamide mononucleotide comprising the steps of

(a) reacting ribose-5-phosphate with a basic material selected from the group of ammonia, primary and secondary amines and mixtures thereof in a polar, non-aqueous solvent solution; and

(b) reacting the resulting product with a pyridinium salt having the following formula:

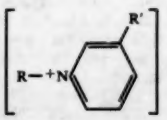


where R is a nitroaromatic group, R′ is a carbamoyl, alkyl, acetyl or alkoxycarbonyl group and X is a halide or other anion for charge balance.

3. A method of preparing nicotinamide adenine dinucleotide comprising the steps of:

(a) reacting ribose-5-phosphates with a basic material selected from the group of ammonia, primary and secondary amines and mixtures thereof while in a polar, non-aqueous solution;

(b) reacting the resulting product with a pyridinium salt having the following formula:



where R is a nitroaromatic group, R′ is a carbamoyl, alkyl, acetyl or alkoxycarbonyl group and X is a halide or other anion for charge balance; and

(c) reacting the second resulting product with adenosine triphosphate in the presence of nicotinamide adenine dinucleotide pyrophosphorase.

4,411,996

PROCESS FOR ISOMERIZING GLUCOSE

Norman E. Lloyd, Clinton, Iowa, assignor to Nabisco Brands, Inc., Parsippany, N.J.

Filed Jun. 30, 1982, Ser. No. 393,845
Int. Cl.³ C12P *19/24*; C12N *9/96*
U.S. Cl. 435—94 **39 Claims**

1. A process for isomerizing glucose to fructose which comprises contacting a glucose-containing feed liquor containing from about 20 to about 65 weight percent glucose with chemically stabilized glucose isomerase at a temperature of from about 90° C. to about 130° C. at a pH of from about 3.5 to about 8 and a contact time of from about 10 seconds to about 5 hours to convert at least about 53 to about 60 weight percent of the glucose present in said liquor to fructose with no substantial formation of psicose.

4,411,997

METHOD FOR PRODUCING L-LYSINE BY FERMENTATION

Keishi Shimazaki; Yoshihiro Nakamura, and Yasutsugu Yamada, all of Saga, Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed Dec. 22, 1981, Ser. No. 333,455
Claims priority, application Japan, Dec. 29, 1980, 55-185676
Int. Cl.³ C12P *13/08*; C12N *15/00, 1/20*; C12R *1/13, 1/15*
U.S. Cl. 435—115 **7 Claims**

1. A method for producing L-lysine by fermentation, which comprises: culturing aerobically in a culture medium a mutant of the genus Brevibacterium or Corynebacterium which is resistant to ethylene glycol and capable of producing L-lysine; and recovering the L-lysine which accumulates in the culture medium.

4,411,998

SUPPRESSING METHOD OF ISO-CITRIC ACID FORMATION IN PRODUCING CITRIC ACID FROM HYDROCARBONS BY FERMENTATION

Takao Matsumoto; Atsushi Fujimaki, and Takeo Nagata, all of Yokohama, Japan, assignors to Showa Oil Company, Ltd., Japan

Filed Mar. 19, 1982, Ser. No. 359,773
Int. Cl.³ C12P *7/48*
U.S. Cl. 435—144 **2 Claims**

1. A method for suppressing iso-citric acid formation in producing citric acid from hydrocarbons by fermentation, comprising the steps of:

providing microoganisms selected from the group consisting of *Candida tropicalis, Candida lipolytica, Candida intermedia* and *Candida brumptii* and their mutants and their variants;

adding said microorganisms to a culture medium containing olefinic hydrocarbons; further adding to said medium from 0.005 to 0.5 percent on a weight basis of said culture medium of surface active agent selected from the group consisting of polyoxyethylene sorbitan monooleate, polyoxyethylene sorbitan monolaurate and sorbitan monooleate; and

culturing said microorganisms under aerobic conditions to produce a mixture of citric acid and isocitric acid, wherein the ratio of citric to isocitric acid is at least 2:1.

4,411,999

IMMOBILIZATION OF ENZYMES ON GRANULAR GELATIN

Shigeki Shigesada; Hironoshin Kitagawa; Toshio Mihara, and Yoshiaki Ishimatsu, all of Machida, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1981, Ser. No. 306,870

Int. Cl.³ C12N *11/02, 11/00*

U.S. Cl. 435—177 **12 Claims**

1. A process for producing an immobilized enzyme composition, which comprises:

simultaneously reacting a non-proteolytic enzyme, a water soluble multi-functional reagent and a water soluble protein polymer selected from the group consisting of casein, albumin, gelatin and soybean protein with a non-hardened granular gelatin in the form of flakes, spherical granules or pellets having a particle size within the range of from 0.1 to 2.0 mm to form a film of the non-proteolytic enzyme immobilized on the surface of said granular gelatine, said non-proteolytic enzyme, water soluble multi-functional reagent and water soluble protein polymer being in solution when reacted with said granular gelatin, and the weight ratio of the non-proteolytic enzyme to granular gelatin ranging from 1:2 to 1:100, the weight ratio of the non-proteolytic enzyme to water soluble multi-functional reagent ranging from 1:0.01 to 1:2, the weight ratio of the non-proteolytic enzyme to water soluble protein polymer ranging from 1:0.01 to 1:2 and the weight ratio of the granular gelatin to the aqueous medium ranging from 1:0.2 to 1:3.

4,412,000

METHOD OF BINDING A BIOLOGICALLY ACTIVE MATERIAL TO A CARRIER CONTAINING HYDROXYL GROUPS

Hans-Dieter Lehmann; Gerd G. Krisam, both of Hechingen, and Ruth S. Golla, Hechingen-Weilheim, all of Fed. Rep. of Germany, assignors to Gambro Dialysatoren KG, Fed. Rep. of Germany

Filed Nov. 12, 1981, Ser. No. 320,215

Claims priority, application Sweden, Nov. 19, 1980, 8008096

Int. Cl.³ C12N *11/12, 11/08, 11/06*

U.S. Cl. 435—179 **13 Claims**

2. A method of binding a biologically active material to a carrier containing hydroxyl groups, said method comprising the steps of reacting a sufficient amount of an isocyanate compound with said carrier in the presence of a non-toxic titanium based compound which catalyzes the formation of urethane bonds to form an isocyanate-containing carrier; treating the isocyanate-containing carrier to remove therefrom titanium based compound; and binding said biologically active material to the isocyanate-containing carrier.

4,412,001

ISOLATION OF BACTERIAL LUCIFERASE

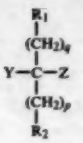
Thomas O. Baldwin, and Thomas F. Holzman, both of Bryan, Tex., assignors to Board of Trustees of The University of Illinois, Urbana, Ill.

Continuation-in-part of Ser. No. 230,178, Jan. 30, 1981, abandoned. This application Dec. 3, 1981, Ser. No. 326,244

Int. Cl.³ C12N *9/02;* C12Q *1/66*

U.S. Cl. 435—189 **11 Claims**

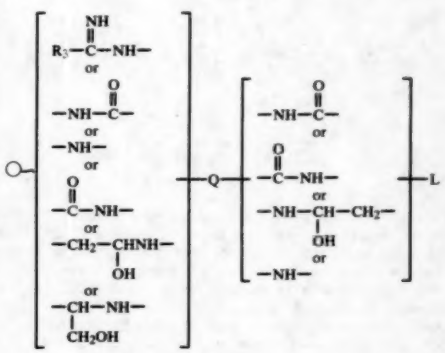
1. A method for isolating bacterial luciferase which comprises saturating an affinity resin which comprises a support material, a spacer arm and a ligand as described in the following Formulas J and K wherein ○— represents the support material; R_3 is oxygen or sulfur; each of R_4 and R_5 is sulfur, oxygen or —NH—; m is an integer from 2 to 6; Q is a straight or branched alkylene moiety having from 2 to 8 carbon atoms; L is



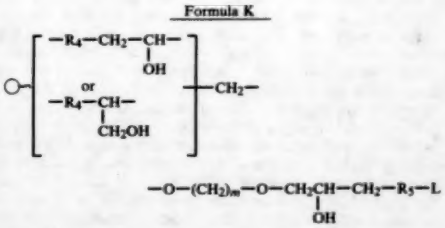
wherein Y is a bond or an alkylene chain of 1 to 4 carbon atoms, one or two carbon atoms of which may be branched; Z is hydrogen or a straight or branched alkyl group having from 1 to 4 carbon atoms; q is zero or one; p is zero, one or two; R_1 is hydrogen, phenyl or phenyl substituted with one or two substituents selected from halogen, trihalomethyl, a straight or branched alkoxy group having from 1 to 4 carbon atoms or a straight or branched alkyl group having from 1 to 4 carbon atoms; and R_2 is ortho, meta or para-biphenylyl, phenyl, or phenyl substituted with one or two substituents selected from halogen, trihalomethyl, a straight or branched alkoxy group having from 1 to 4 carbon atoms or a straight or branched alkyl group having from 1 to 4 carbon atoms with the provisos that: (a) when R_2 is biphenylyl, each of p and q is zero and R_1 is hydrogen; (b) when p is two, q is zero; and (c) when R_2 is other than biphenylyl, R_1 is other than hydrogen, or when the functional linkage in the right hand bracket is other than

L is 2-(2,4-dichloro-6-phenylphenoxy)ethanyl or 2-(2,3-dichloro-6-phenylphenoxy)ethanyl:

Formula J



Formula K



with a sample containing bacterial luciferase suspended in an appropriate anionic buffer solution, washing said saturated resin with additional anionic buffer to remove unbound pro-

tein, eluting said washed saturated resin with an appropriate cationic buffer solution and recovering the bacterial luciferase therefrom.

4,412,002

PROCESS FOR PREPARING HEPATITIS A VIRUS

William J. McAleer, Ambler; Fred J. Bailey, Hatfield, and Henry Z. Markus, Wincote, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 26, 1982, Ser. No. 352,667
Int. Cl.³ C12N *7/08*
U.S. Cl. 435—237 **4 Claims**

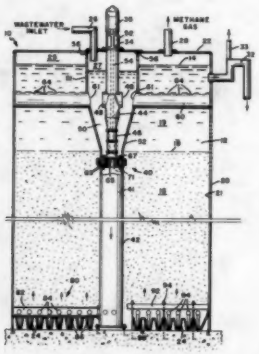
1. A method of growing hepatitis A virus in vitro in a cell culture susceptible to infection by hepatitis A virus comprising trypsinizing a culture of susceptible cells persistently infected with hepatitis A virus, replanting at least part of the trypsinized cells at least one additional time, and harvesting hepatitis A virus from at least some of the replanted cells.

4,412,003

INTEGRAL FLOW CIRCULATOR FOR FLUID BED REACTOR

Richard R. Evans, Norwalk, Conn., assignor to Dorr-Oliver Inc., Stamford, Conn.

Filed Jul. 30, 1981, Ser. No. 288,270
Int. Cl.³ C12M *1/00*
U.S. Cl. 435—287 **1 Claim**



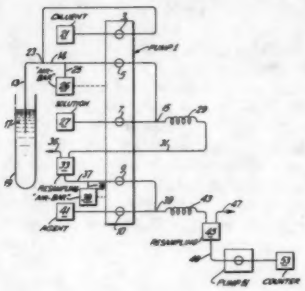
1. A fluid bed reactor for containing a volume of waste water undergoing treatment together with inert particulate material, comprising a reactor tank adapted for anaerobic biological processes which generate combustible gases in that it is provided with an air-tight cover, a gas space over the liquid in said reactor tank, a flow circulator in said reactor tank, including a column conduit extending from the bottom to the top of said reactor tank, a pump in said column conduit arranged to discharge vertically downward, a pump motor operatively connected to said pump and mounted on said cover, a pump well wall surrounding the upper end of said column conduit and the pump therein and having sealing contact with said cover, said pump well wall extending through said gas space into the liquid within said reactor tank, thereby providing a gas zone of limited volume within said pump well so that only said limited volume of gas is discharged into the atmosphere when said pump-containing section of said column conduit is withdrawn from said tank, a plurality of fixed, perforated, horizontal collection manifolds in flow connection with and positioned proximate the upper end of said column conduit but below the surface of the liquid in said reactor tank, a plurality of fixed, horizontal distributor headers adjacent the bottom of said reactor tank in flow connection with the column conduit, distributor pipes connected to said distributor header for injecting fluidizing liquid essentially uniformly across the cross-section of said reactor tank and adjacent the bottom thereof and an influent pipe in flow connection with said column conduit having connection with an external source of waste water.

4,412,004

METHOD FOR TREATING RED BLOOD CELLS TO EFFECT SPHERING AND REAGENT THEREFOR

Leonard Ornstein, White Plains, and Young R. Kim, Hartsdale, both of N.Y., assignors to Technicon Instruments Corporation, Tarrytown, N.Y.

Filed Jun. 26, 1981, Ser. No. 277,539
Int. Cl.³ G01N *33/48, 21/49*
U.S. Cl. 436—10 **27 Claims**



1. A diagnostic method for treating mammalian red blood cells in a sample to provide a sample which can be effectively measured electrooptically for determination of red blood cell volumes which process comprises combining an anticoagulated whole blood sample with a first isotonic solution containing sphering agent, and treating an aliquot of the resulting sample with a second isotonic solution containing a protein which reversibly binds the sphering agent and containing a sphering agent wherein the weight ratio of protein sphering agent in the aliquot and the final sample is from about 20:1 to about 70:1 and the concentration of sphering agent in said final sample is from about 2 mg./100 ml. to about 10 mg./100 ml.; and whereby the presence of the prescribed concentration of sphering agent could lead to lysis if sufficient of said protein were not present and a low red blood cell count existed in the original sample; and whereby the presence of less than the prescribed concentration of the sphering agent could lead to incomplete sphering if a high red blood cell count existed in the original sample.

2. The method of claim 1 wherein said whole blood sample is prediluted with saline as diluent resulting in about a 50% by volume dilution of sample.

10. The method of claim 2 wherein the final sample which contains sphered ree blood cells without volume change is subjected to light scattering measurement for red blood cell count and volume determination.

4,412,005

DETERMINATION OF TOTAL BILIRUBIN

Tai-Wing Wu, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

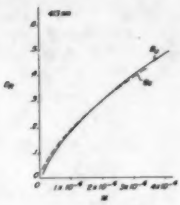
Filed Oct. 25, 1979, Ser. No. 88,230
Int. Cl.³ G01N *33/72*
U.S. Cl. 436—97 **14 Claims**

1. A spectrophotometric method for the determination of the B$_T$ content of an aqueous liquid, said method comprising:

(a) contacting together said aqueous liquid and an essentially dry reagent zone of a test element, said reagent zone

comprising an interactive mordant for bilirubin to mordant bilirubin, and

(b) spectrophotometrically detecting in said test element the



absorption spectrum of said aqueous liquid for B_T at a wavelength within the range of from about 385 to about 425 nm at which the absorption characteristics of mordanted B_u and mordanted B_c are effectively identical.

4,412,006

METHOD FOR DETERMINATION OF NITRATE AND/OR NITRITE

Robert D. Cox, Austin, Tex., and Clyde W. Frank, Iowa City, Iowa, assignors to University of Iowa Research Foundation, Iowa City, Iowa

Continuation of Ser. No. 174,690, Aug. 1, 1980, abandoned. This application Mar. 25, 1982, Ser. No. 361,586

Int. Cl.³ G01N *21/76*

U.S. Cl. 436—110 **4 Claims**

1. A method of selective determination of nitrite content of a test sample containing nitrite, and nitrate, and thereafter determining nitrate content of said sample, without also determining additional nitrogen content, said method comprising:

solubilizing a test sample containing nitrite and nitrate,

reducing the nitrite content of said sample with a weakly acidic solution of a water soluble iodide salt to produce nitric oxide, without also reducing the nitrate content,

stripping said nitric oxide from the reduction reaction mixture,

reacting said nitric oxide with ozone in a chemiluminescence reaction, and

determining the magnitude of the chemiluminescence reaction to indicate the nitrite content of said sample, and thereafter,

reducing the nitrate content of said sample with a strongly acidic solution of a transition metal reducing system selected from the group of ferrous ion in the presence of molybdenum ion, or titanium ion, to produce nitric oxide, without also reducing additional nitrogen content,

stripping said nitric oxide from the reduction reaction mixture,

reacting said nitric oxide with ozone in a chemiluminescence reaction, and

determining the magnitude of the chemiluminescence reaction to indicate the nitrate content of said sample.

4,412,007

RAPID METHOD FOR BITUMEN ANALYSIS

Raymond N. Yong, Beaconsfield, and Amar J. Sethi, Quebec, both of Canada, assignors to Suncor, Inc., Toronto, Canada

Filed Jan. 20, 1982, Ser. No. 340,946

Int. Cl.³ G01N *33/24*

U.S. Cl. 436—139 **3 Claims**

1. A method for estimating the bitumen content in a material comprised of tar sands tailings or sludge which comprises (1) titrating samples of said materials with methylene blue to an end point showing no further adsorption of said methylene blue and relating said amount of adsorbed methylene blue to clay mineral content from an empirical curve, multiplying said clay mineral content by 0.0234 to obtain the percent adsorbed organic content of said sample, (2) determining the percent of total organic material of said material by a chromic acid oxida-

tion and subtracting the percent adsorbed organics from the percent total organics from the percent total organics to obtain the percent bitumen in said material.

4,412,008

COMPOSITE SINTER OF SILICON NITRIDE/BORON NITRIDE AND METHOD FOR MANUFACTURING THEREOF

Akira Miyamoto, Tokyo; Masaru Ishikawa; Masaaki Nishi, both of Fukuyama; Kenki Ishizawa, and Akira Shiranita, both of Bizen, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha and Shinagawa Shiroenga Kabushiki Kaisha, both of Tokyo, Japan

Filed Feb. 11, 1981, Ser. No. 234,939

Claims priority, application Japan, Feb. 23, 1980, 55-21070

Int. Cl.³ C04B *35/58*

U.S. Cl. 501—97 **10 Claims**

1. A method for manufacturing a composite sinter of silicon nitride/boron nitride which consists essentially of a network of silicon nitride within the range of from 60 to 97 wt. % and boron nitride within the range of from 3 to 40 wt. % as a dispersed phase in said network of said silicon nitride which comprises:

kneading silicon powder within the range of from 47.3 to 95.1 wt. % and boron nitride powder within the range of from 4.9 to 52.7 wt. %, as raw materials, with an organic solvent solution containing a dispersant and a binder;

press-forming the resultant kneaded mixture to prepare a green compact;

sintering said green compact in a non-oxidizing atmosphere at a temperature within the range of from 1,100° to 1,300° C. to prepare a sinter having a strength permitting machining;

machining said sinter; and,

sintering said machined sinter in a nitrogen atmosphere at a temperature within the range of from 1,250° to 1,450° C. to nitrify the same, thereby improving the strength and thermal shock resistance of said sinter.

4,412,009

SINTERED Si_3N_4 BODY

Michiyasu Komatsu; Akihiko Tsuge, both of Yokohama; Katsutoshi Komeya, Kanagawa, and Akio Ando, Kawasaki, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Continuation of Ser. No. 122,659, Feb. 19, 1980, Pat. No. 4,327,187. This application Sep. 23, 1981, Ser. No. 304,720

Claims priority, application Japan, Feb. 22, 1979, 54-19013

The portion of the term of this patent subsequent to Apr. 27, 1999, has been disclaimed.

Int. Cl.³ C04B *35/50, 35/58*

U.S. Cl. 501—97 **5 Claims**

1. A sintered ceramic body consisting essentially of at most

10%, exclusive of 0%, by weight of yttrium oxide; at most 10%, exclusive of 0%, by weight of aluminum nitride; at most 10%, exclusive of 0%, by weight of aluminum nitride; at most 5%, exclusive of 0%, by weight of at least one material selected from the group consisting of titanium oxide, magnesium oxide and zirconium oxide; and the balance essentially of silicon nitride; wherein said sintered ceramic body has a relative density of at least 95.1%.

4,412,010

ARC RESISTANT INSULATOR

Isao Ishii; Tadaki Murakami; Yoshiaki Sakamoto; Yoshikazu Utsumi, all of Amagasaki; Tatsuharu Nakamura, and Hiroshi Takayanagi, both of Sanda, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 14, 1982, Ser. No. 378,382

Claims priority, application Japan, May 15, 1981, 56-73170

Int. Cl.³ C04B *35/10*

U.S. Cl. 501—153 **10 Claims**

1. An arc resistant insulator which is composed of a matrix of a composite composition comprising an insulating base material containing aluminum oxide and/or aluminum hydroxide and mica powder, and a zinc borate hydrate composed essentially of $2ZnO.3B_2O_3.3H_2O$.

4,412,011

POLYMERIC CHOLESTEROL REDUCING AGENT HAVING VINYLIMIDAZOLE PENDANT GROUPS

Kunio Kihara; Hideo Toda; Motokuni Mori, and Koji Sato, all of Amimachi, Japan, assignors to Mitsubishi Petrochemical Co., Ltd. and Mitsubishi Yuka Pharmaceutical Co., Ltd., both of Tokyo, Japan

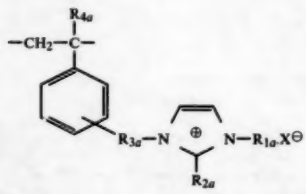
Filed Oct. 13, 1981, Ser. No. 311,069

Claims priority, application Japan, Mar. 2, 1981, 56-28378

Int. Cl.³ B01J *39/20*; C08F *26/06*; A61K *31/785*

U.S. Cl. 521—38 **12 Claims**

1. A cholesterol reducing agent which consists essentially of a water-insoluble anion exchange resin composed of from 10 to 98 mole % of a structural unit represented by the formula A



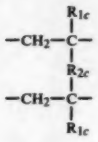
A

where, R_{1a} is an alkyl group of from 1 to 12 carbon atoms, an aryl group of from 6 to 8 carbon atoms, an aralkyl group of 7 or 8 carbon atoms, or a $-CH_2CH(OH)CH_2Cl$ group; R_{2a} is a hydrogen atom, an alkyl group of from 1 to 17 carbon atoms, an aryl group of from 6 to 8 carbon atoms, or an aralkyl group of 7 or 8 carbon atoms; R_{3a} is an alkylene group of from 1 to 3 carbon atoms; R_{4a} is a hydrogen atom, a methyl group or an ethyl group; and $X^{\ominus}$ is a halogen ion, a hydroxyl ion, or $\frac{1}{2}$ (sulfate ion), from 0 to 90 mole % of a structural unit represented by the formula B

B

where R_{1b} is a hydrogen atom, a methyl group or an ethyl group; and R_{2b} is an aryl group of from 6 to 8 carbon atoms, a

group (where R_3 is a hydrogen atom, an alkyl group of from 1 to 6 carbon atoms, or a glycidyl group) or an acryloxyl group, and from 0.1 to 30 mole % of a structural unit represented by the formula C



C

where R_{1c} is a hydrogen atom or a methyl group; R_{2c} is an arylene group of from 6 to 8 carbon atoms, an alkylene group of from 1 to 12 carbon atoms, or a

group (where n=1 to 8).

4,412,012

CURING POLYEPOXIDE RESIN BINDERS IN SYNTACTIC FOAM FORMING COMPOSITIONS

Robert W. Bouley, East Springfield, and Robert F. Kovar, Wrentham, both of Mass., assignors to Albany International Corp., Albany, N.Y.

Filed Mar. 25, 1982, Ser. No. 361,741

Int. Cl.³ C08J *9/32*

U.S. Cl. 521—54 **3 Claims**

1. A method of curing the polyepoxide resin binder component of a syntactic foam forming composition having a thickness in excess of circa 10 to 12 inches, and which comprises in admixture a curable polyepoxide resin matrix and a filler which comprises a plurality of hollow microspheres, said composition containing less than 45 percent by volume of hollow macrospheres, comprising the steps of; curing the polyepoxide component with a curing agent which is provided by the hydrolysis of the reaction product consisting essentially of (1) an organic polyepoxide curing agent possessing a primary amine group and (2) a mole of a ketone of the formula:

wherein R_1 and R_2 are each independently selected from the group consisting of monovalent organic radicals for each of said amine groups, said reaction product having been premixed and reacted before addition to the curable polyepoxide resin binder component, whereby said curing occurs.

4,412,013

EXPANDABLE URETHANE SEALANT COMPOSITIONS

Yun F. Chang, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/01302, § 371 Date Sep. 20, 1982, § 102(e) Date Sep. 20, 1982

PCT Filed Sep. 20, 1982, Ser. No. 434,641

Int. Cl.³ C08G *18/14, 18/22*

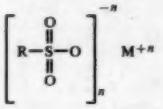
U.S. Cl. 521—121 **24 Claims**

1. A two component expandable urethane sealant composition comprising liquid reactive elastomer and polyisocyanate, characterized in that said composition comprises:

(A) a mixture of:

(i) liquid reactive elastomer (a) having a number average molecular weight (M_n) between about 1500 and about 15,000, (b) containing pendant hydroxyl groups, and (c) being liquid at between about 20° and about 25° C.; and

(ii) metal salts of organic sulfonates having the formula:



wherein R is selected from C_8–C_{36} hydrocarbon groups and M is a metal ion wherein n=1, 2 or 3; and

(B) polyisocyanate having at least two isocyanate groups per molecule, and

wherein said elastomer and said metal salts of organic sulfonates are present in said mixture in amounts so as to provide between about 20 and about 80 percent hydroxyl groups and between about 80 and about 20 percent sulfonate groups based on the total of said hydroxyl groups and said sulfonate groups; and

wherein said polyisocyanate is included in said composition in an amount so as to provide between about 0.85 and 1.15 reactive isocyanate groups for each reactive functional group present in said composition either as a hydroxyl group on said liquid reactive elastomer or as a sulfonate group of said metal salts of organic sulfonates.

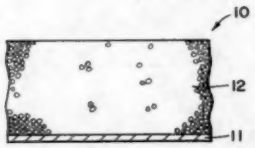
4,412,014
EXTRACTION OF POLYOXYALKYLENE SURFACTANTS FOR PHENOLIC FOAM STABILIZATION

Richard L. Frentzel, and Ernest K. Moss, both of Clearwater, Fla., assignors to The Celotex Corporation, Tampa, Fla.

Continuation of Ser. No. 113,909, Jan. 21, 1980, abandoned. This application Jun. 29, 1981, Ser. No. 278,139

Int. Cl.³ C08J *9/14*

U.S. Cl. 521—129 **14 Claims**



1. A foam material comprising a mixture of:

A. a phenol aldehyde resin foam forming reactants wherein the phenol of said resin consists of phenol and orthocresol in the ratio of about 4:1.

B. a blowing agent, and

C. a surfactant which is the major component of a free radical polymerization, said major component being obtained by the steps of:

(1) reacting together a cyclic nitrogenous vinyl monomer and an esterified unsaturated dibasic acid by free radical polymerization in the presence of a polyoxyalkylene adduct having the formula

$$H\text{-}(\text{polyoxyalkylene chain})_t\text{-}R,$$

wherein R is an organic or inorganic radical and t is the number of polyoxyalkylene chains reacted onto R, said polyoxyalkylene adduct being treated either before or after said polymerization with a capping agent capable of reacting with the hydroxyl groups of said adduct to reduce the hydroxyl number of said adduct to less than 50, whereby a reaction product is obtained which can be used as a surfactant in the formation of phenolic foams, said step (1) reaction product comprising said major component formed from the reaction of said cyclic nitrogenous vinyl monomer and unsaturated diester onto said polyoxyalkylene adduct and a minor component comprising a copolymer of said cyclic nitrogenous vinyl monomer and unsaturated diester which does not chemically react with said polyoxyalkylene adduct, the capacity of said major component for stabilizing phenolic foams being greater than that of said total step (1) reaction product; and

(2) separating from said step (1) reaction product by any conventional method said major and minor components thereof, and utilizing said major component as the sole surfactant in the foaming reaction, having removed the minor component from said step (1) reaction product.

4,412,015
DENTAL FILLER MATERIAL CONTAINING ZEOLITE FOR DENTAL COMPOSITE AND METHOD OF MANUFACTURE

Stewart J. Lustgarten, 73 Dalton Rd., Holliston, Mass. 01746, and Jürgen Engelbrecht, Kanalstrasse 37, Hamburg 76, Fed. Rep. of Germany

Filed May 4, 1981, Ser. No. 260,394

Claims priority, application Fed. Rep. of Germany, Sep. 12, 1980, 3034374

Int. Cl.³ C08K *9/04*; A61K *6/02*

U.S. Cl. 523—116 **11 Claims**

1. A polishable dental material composite comprising:

a binder resin of unreacted polymerizable acrylate containing monomors or oligomers; a free radical initiating agent for polymerizing said binder and finely divided particles of inorganic filler constituting at least 60% by weight of said composite with said inorganic filler composed primarily of zeolite crystals having a stereo lattice structure with a proportion of said inorganic filler having a coating thereon of a polymerized acrylate containing monomers or oligomers in a ratio of uncoated to coated filler particles between 1:10 and 10:1 by weight.

4,412,016
PROPYLENE POLYMER COMPOSITION

Osamu Fukui, Toyonaka; Yoshiro Umemoto, Nagoya; Tsugumi Sanmiya, Toyota; Yutaka Sano, Kishiwada, and Kazuyoshi Tanaka, Sakai, all of Japan, assignors to UBE Industries, Ltd. and Toyota Jidosha Kogyo Kabushiki Kaisha, both of Osaka, Japan

Filed Mar. 19, 1982, Ser. No. 359,763

Claims priority, application Japan, Mar. 30, 1981, 56-45494

Int. Cl.³ C08F *23/16*, *53/00*

U.S. Cl. 523—206 **13 Claims**

1. A propylene polymer composition comprising

(A) 45 to 65% by weight of at least one crystalline ethylene-propylene block copolymer in which the content of the polymerized ethylene is in the range of from 5 to 10% by weight, in which the polypropylene component has a fraction thereof insoluble in boiling n-heptane, in an amount of 95% or more based on the weight of said polypropylene component, in which a fraction thereof soluble in p-xylene at room temperature, has an intrinsic viscosity of from 3 to 4 determined in decahydronaphthalene at a temperature of 135° C. and which has a melt flow index of from 5 to 70;

(B) 25 to 40% by weight of at least one amorphous ethylene-propylene copolymer having an intrinsic viscosity of from 2.0 to 3.5 determined in decahydronaphthalene at a temperature of 135° C., and a Mooney viscosity ML_{1+4} of from 40 to 100 determined at a temperature of 100° C.;

(C) 4 to 20% by weight of at least one high density polyethylene having a melt flow index of from 1 to 10; and

(D) 3 to 20% by weight of talc in the form of fine particles having an average size of from 0.01 to 5 microns, in which composition, the ratio in weight of said amorphous ethylene-propylene copolymer (B) to said high density polyethylene (C) is in the range of from 10:1 to 5:3.

4,412,017
COMPOSITIONS FOR BONDING FIBROUS SUBSTRATES

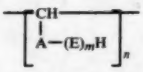
Donald N. Van Eenam, Des Peres, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 121,849, Feb. 15, 1980, Pat. No. 4,308,187. This application Jun. 5, 1981, Ser. No. 270,933
The portion of the term of this patent subsequent to Dec. 29, 1998, has been disclaimed.
Int. Cl.³ D21H *3/44*
U.S. Cl. 523—408 **12 Claims**

1. A polymer composition comprising:

(A) from 5 to 99.5 percent by weight of thermoplastic predominantly linear polymer comprising intralinear unsaturated linkages in the form of solid, stably dispersed latex particles; and

(B) from 95 to 0.5 percent by weight of a liquid hydrophilic polymer having a backbone comprising at least one segment with the formula



wherein A is a moiety terminating in the residue of an active hydrogen-containing group selected from the group consisting of alcoholic hydroxyl, thiol, amide, carboxylic acid and secondary amine with an active hydrogen removed, E is a moiety containing a radical having an activated olefinic unsaturation either α,β of β,α to the activating group; n is the number of adjacent segments having this formula and n and m are integers and are each at least one provided that where either is less than 4, the other is at least four; all weights being based on the total polymer weight in the composition.

4,412,018
ORGANOPHILIC CLAY COMPLEXES, THEIR PREPARATION AND COMPOSITIONS COMPRISING SAID COMPLEXES

Claude M. Finlayson, Houston, Tex., and Wilbur S. Mardis, Trenton, N.J., assignors to NL Industries, Inc., New York, N.Y.

Filed Nov. 17, 1980, Ser. No. 207,542
Int. Cl.³ B01J *13/00*; C08K *9/04*
U.S. Cl. 523—508 **24 Claims**

1. An organophilic clay gellant comprising:

(a) a smectite-type clay having a cation exchange capacity of at least 75 milliequivalents per 100 grams of said clay;

(b) an organic anion in an amount ranging from 5 to 100 milliequivalents per 100 grams of said smectite-type clay, 100% active clay basis; and

(c) an organic cation containing at least one group having 12 to 22 carbon atoms, said organic cation being present in an amount sufficient to at least satisfy the cation exchange capacity of the smectite-type clay and the cationic activity of the organic anion wherein the cation exchange sites of the smectite-type clay are substituted with the organic cation and wherein substantially all of the formed organic cation-organic anion complex is intercalated with the smectite-type clay.

20. A thixotropic cross-linkable polyester composition comprising an unsaturated polyester and an unsaturated aromatic monomer having dispersed therein from 0.25 to 10% by weight of an organophilic clay gellant which comprises:

(a) a smectite-type clay having a cation exchange capacity of at least 75 milliequivalents per 100 grams of said clay;

(b) an organic anion in an amount ranging from 5 to 100 milliequivalents per 100 grams of said smectite-type clay, 100% active clay basis; and

(c) an organic cation containing at least one group having 12 to 22 carbon atoms, said organic cation being present in an amount sufficient to at least satisfy the cation exchange capacity of the smectite-type clay and the cationic activity of the organic anion wherein the cation exchange sites of the smectite-type clay are substituted with the organic cation and wherein substantially all of the formed organic cation-organic anion complex is intercalated with the smectite-type clay.

4,412,019
ASPHALT COMPOSITIONS

Gerard Kraus, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 12, 1980, Ser. No. 397,319
Int. Cl.³ C08L *95/00*
U.S. Cl. 524—71 **12 Claims**

1. Asphalt-rubber-sulfur compositions of improved physical properties comprising:

(a) about 40–95 parts by weight of asphalt,

(b) about 5–20 parts by weight of a hydrogenated synthetic diene rubber, and

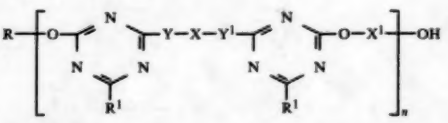
(c) about 1–40 parts by weight of sulfur.

4,412,020
NOVEL LIGHT STABILIZERS FOR POLYMERS

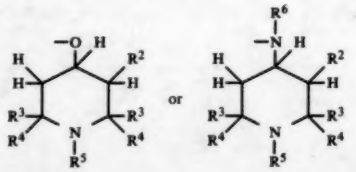
Frank F. Loffelman, and Joseph A. Hoffman, both of Bridgewater, N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jul. 20, 1981, Ser. No. 284,890
Int. Cl.³ C08K *5/34*
U.S. Cl. 524—100 **20 Claims**

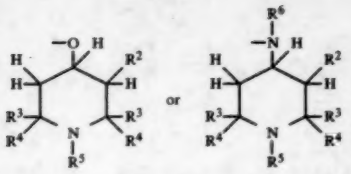
1. An oligomer of the formula:



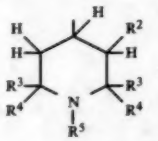
wherein R represents C_1–C_8 alkyl; R^1 represents C_1–C_8 alkoxy, C_1–C_8 alkyl, halo, C_1–C_8 alkylthio, amino, C_1–C_{18} alkylamino, C_1–C_{18} dialkylamino, morpholino, pyrrolidyl, piperidino the groups



wherein R^2, R^3, R^4, R^5 and R^6 are as defined below, a substituted C_1–C_{18} alkylamino or C_1–C_{18} dialkylamino, wherein the substitutents are selected from amino, cyano, carboxy, alkoxycarbonyl wherein the alkoxy moiety has 1–8 carbon atoms, and the groups



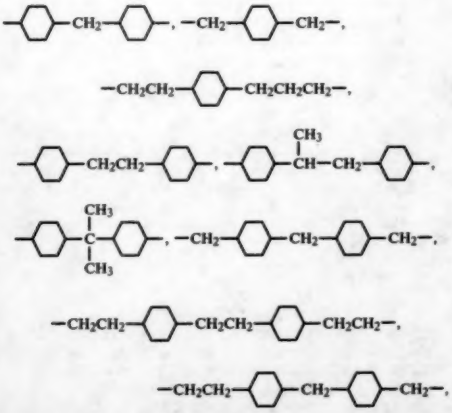
wherein R^2 represents hydrogen, C_1–C_8 alkyl, or benzyl; R^3 and R^4 independently represent C_1–C_8 alkyl, benzyl, or phenethyl, or together with the carbon to which they are attached form a C_5–C_{10} cycloalkyl; R^5 represents hydrogen, C_2–C_3 hydroxyalkyl, C_1–C_8 alkyl, hydroxyl, or oxyl; and R^6 represents hydrogen, C_1–C_8 alkyl or



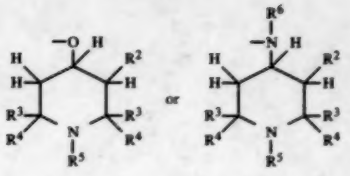
Y and Y^1, which may be the same or different, represent oxy or

wherein R^6 is as previously defined; X and X^1 represent C_2–C_{18} alkylene, wherein the alkylene chain may be interrupted by one or more oxy, thio, or

radicals, C_5–C_{10} cycloalkylene,



C_6–C_{12} arylene, or C_8–C_{14} aralkylene, and n is an integer greater than 1; with the proviso that when Y and Y^1 are oxy, or R^6 is hydrogen or C_1–C_{16} alkyl, at least one R^1 is



4,412,021

NOVEL POLYALKYLPIPERIDYL-UREAS AND THEIR USE AS STABILIZERS

Friedrich Karrer, Zofingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

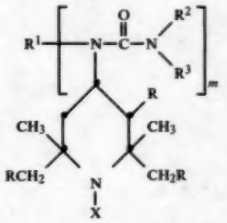
Continuation of Ser. No. 158,038, Jun. 9, 1980, abandoned. This application Feb. 23, 1982, Ser. No. 351,577

Claims priority, application Switzerland, Jun. 21, 1979, 5807/79

Int. Cl.[3] **C08K** *5/34;* **C07D** *211/56, 211/92*

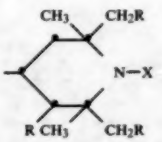
U.S. Cl. 524—102 **7 Claims**

1. A compound of the formula I



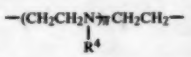
I

in which m is 1, 2, 3 or 4, X is H, O, C_1–C_{18}-alkyl, C_3–C_5-alkenyl, propargyl, C_7–C_{12}-phenylalkyl or a group of the formula —CO—C_1–C_8-alkyl, —CO—C_2–C_3-alkenyl, —CO—O—C_1–C_{10}-alkyl or —CO—N—(C_1–C_{10}-alkyl)$_2$, R is hydrogen and R^1, if m is 1, is C_1–C_{18}-alkyl, C_3–C_5-alkenyl, C_3–C_4-alkynyl, C_5–C_6-cycloalkyl, C_7–C_{18}-aralkyl, C_6–C_{12}-aryl or a group of the formula II

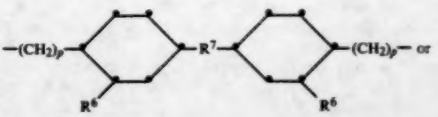


II

or, if m is 2, is C_2–C_{20}-alkylene, C_4–C_{12}-mono- or -di-oxaalkylene, a



or —$(CH_2)_3$—$N(R^5)$—$(CH_2)_3$-group, cyclohexylene, xylylene, hexahydroxylylene or a



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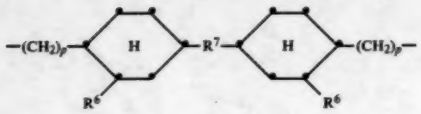
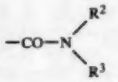
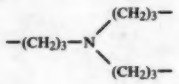


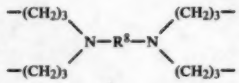
group, in which R^4 is hydrogen, C_1–C_4-alkyl, allyl, benzyl or a



group, n is an integer from 1 to 5, R^5 is C_1–C_{12}-alkyl, phenyl or cyclohexyl, p is nought or 1, R^6 is hydrogen or methyl and R^7 is $—CH_2—$ or $>C(CH_3)_2$, or R^1, if m is 3, is a



radical and if m is 4 is a radical of the formula



in which R^8 is C_2–C_{20}-alkylene, cyclohexylene or xylylene, and R^2 and R^3 independently of one another are C_1–C_{12}-alkyl, cyclohexyl, C_3–C_5-alkenyl, propargyl, C_7–C_{12}-phenylalkyl or C_6–C_{12}-aryl, and R^2 can also be C_1–C_4-alkoxy, or R^2 and R^3 together form C_4–C_9-alkylene or 3-oxa-1,5-pentylene.

4,412,022

POLYURETHANE COATING COMPOSITIONS PREPARED FROM A POLYMERIC DIOL, AN ALICYCLIC DIISOCYANATE, AN ALICYCLIC DIAMINE AND EITHER HYDRAZINE OR ISOPHTHALIC ACID DIHYDRAZIDE

Koji Hirai; Kenji Shirano, both of Kurashiki, and Takayuki Okamura, Okayama, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed May 5, 1982, Ser. No. 374,923

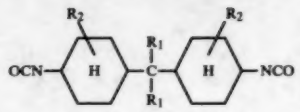
Claims priority, application Japan, May 19, 1981, 56-76199; Jul. 21, 1981, 56-114799; Oct. 13, 1981, 56-163964

Int. Cl.³ C08L 75/08

U.S. Cl. 524—104 **7 Claims**

1. A polyurethane composition which comprises a polyurethane synthesized substantially from (a) a polymeric diol having an average molecular weight within the range of 1,200 to 2,500, (b) an alicyclic organic diisocyanate, (c) an alicyclic organic diamine and (d) hydrazine or isophthalic acid dihydrazide and a mixed solvent capable of dissolving said polyurethane, said polyurethane satisfying the following conditions (i) through (iv), namely

(i) that component (b) comprises at least 20 mole percent thereof of an alicyclic organic diisocyanate having the formula

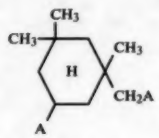


(I)

wherein R_1 and R_2 each is a hydrogen atom or a lower alkyl group,

(ii) that the mole ratio of component (b) to component (a) is within the range of 2.5 to 5.0,

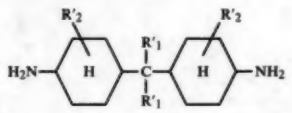
(iii) that at least one of components (b) and (c) comprises as a component thereof a compound having the formula



(II)

wherein A is an amino or isocyanato group and that the total content of the compound or compounds of the above formula (II) based on the sum total of components (b), (c) and (d) is 15 to 45 mole percent, and

(iv) that, when component (d) is hydrazine, component (c) comprises at least 20 mole percent thereof of an alicyclic organic diamine having the formula



(III)

wherein

R_1' and R_2' each is a hydrogen atom or a lower alkyl group and that the mole ratio of component (d) to the sum total of components (c) and (d) is within the range of 0.05 to 0.5, or

that, when component (d) is isophthalic acid dihydrazide, the mole ratio of component (d) to the sum total of components (c) and (d) is within the range of 0.1 to 0.7, and

said mixed solvent satisfying the condition

(v) that it comprises 3 to 70 percent by weight thereof of a compound of the general formula

$$R(CH_2)_nOH \qquad \text{(IV)}$$

wherein R is a hydrogen atom or a methoxy, ethoxy or acetoxy group and, when R is a hydrogen atom, n is an integer of 0 through 4 and when R is a methoxy, ethoxy or acetoxy group, n is 2, and that, when component (d) is isophthalic acid dihydrazide, said mixed solvent comprises 40 to 97 percent by weight thereof of an aprotic polar compound.

4,412,023

COATING COMPOSITION

Olof Jernström, Vantaa; Tapio Mattila, Espoo; Kyösti Penttinen, Helsinki, and Hannu Toivonen, Espoo, all of Finland, assignors to Tikkurilan Varitehtaat Oy, Vantaa, Finland

Filed Nov. 2, 1981, Ser. No. 316,815

Claims priority, application Finland, Nov. 5, 1980, 803452

Int. Cl.³ C08K 5/34

U.S. Cl. 524—106 **6 Claims**

1. A composition suitable for coating, varnishing or as a filler for wood chipboard, which consists of an ordinary paint,

varnish or filler for chipboard including polyvinyl acetate as a binder and 0.2–10% by weight of a cyclic urea compound.

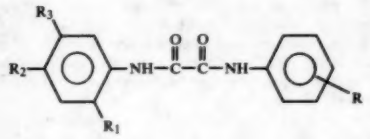
4,412,024

CONCENTRATED SOLUTIONS OF AROMATIC OXAMIDE STABILIZERS

Lajos Avar, Biel-Benken, Switzerland; Evelyne Kalt, Riedisheim, France, and Hellmuth Reinshagen, Heitersheim, Fed. Rep. of Germany, assignors to Sandoz Ltd., Basel, Switzerland

Filed Sep. 14, 1981, Ser. No. 302,036
Int. Cl.³ C07C *103/38*; C09D *7/12*; C08K *5/20*
U.S. Cl. 524—220 20 Claims

1. A solid or liquid concentrate comprising a solution of at least 30% by weight of a mixture of compounds of formula I



I

in which

R is C_{6-22}alkyl or C_{8-14}alkoxy

R_1 and R_2 are independently, hydrogen, C_{1-8}alkyl, C_{1-12}alkoxy, C_{1-12}alkylthio, phenoxy or phenylthio; provided that R_1 and R_2 may not both be selected from alkylthio, phenoxy and phenylthio;

and

R_3 is hydrogen or C_{1-8}alkyl

in a solid or liquid organic solvent, said mixture containing compounds of formula I having different isomers of R.

4,412,025

ANTI-BLOCK COMPOUNDS FOR EXTRUSION OF TRANSITION METAL CATALYZED RESINS

Michael A. Corwin, Millington, and George N. Foster, Bloomsbury, both of N.J., assignors to Union Carbide Corporation, Danbury, Conn.

Continuation-in-part of Ser. No. 242,457, Mar. 11, 1981, abandoned. This application Oct. 8, 1981, Ser. No. 309,658
Int. Cl.³ C08J *5/18*; C08K *3/00, 3/36, 5/13*
U.S. Cl. 524—241 62 Claims

1. In an improved film-forming composition containing:

(a) a transition metal catalyzed olefin polymer containing halide residues;

(b) an anti-gel compound characterized by having at least about 5 repeat units of an alkylene oxide;

(c) a hindered phenolic anti-oxidant; and

(d) an inorganic anti-block agent;

the improvement comprising avoiding a yellowing problem by employing an anti-block agent having a pH of between 6 and 8.

4,412,026

ALDEHYDIC COMPOSITIONS

Forrest L. Collins, Minnetonka, Minn., assignor to Henkel Corporation, Minneapolis, Minn.

Filed Jul. 16, 1981, Ser. No. 284,146
Int. Cl.³ C08K *5/07*
U.S. Cl. 524—354 12 Claims

1. A personal care or disinfectant product composition having an aldehyde in a thickened state comprising:

(a) a low viscosity aldehyde;

(b) a solvent in which the aldehyde is miscible selected from the group consisting of water and alcohols and mixtures thereof; and

(c) a homopolymeric salt of 2-acrylamido-2-methylpropanesulfonic acid in an amount to sufficient to thicken the composition.

4,412,027

THICKENED KETONE COMPOSITIONS

Kenneth Klein, Old Bridge; Patricia E. Bator, Secaucus, both of N.J., and Harry H. Pact, Norwalk, Conn., assignors to Henkel Corporation, Minneapolis, Minn.

Filed Jul. 16, 1981, Ser. No. 284,145
Int. Cl.³ C08K *5/07*
U.S. Cl. 524—364 10 Claims

1. A process for removing nail polish from a nail comprising solvating the polished nail with a composition comprising:

(a) a low viscosity ketone;

(b) a solvent in which the ketone is miscible selected from the group consisting of water and alcohols and mixtures thereof; and

(c) a homopolymeric salt of 2-acrylamido-2-methylpropanesulfonic acid in an amount sufficient to thicken the composition

thereby removing the nail polish from the nail.

4,412,028

CONVERSION OF POLYMER SOLUTIONS INTO SOLIDS OR MORE VISCOUS SOLUTION

Robert D. Lundberg, Bridgewater; Robert R. Phillips, Spring Lake Heights, both of N.J., and Lee A. McDougall, Houston, Tex., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 29, 1981, Ser. No. 335,450
Int. Cl.³ C08K *5/01, 5/07*
U.S. Cl. 524—364 32 Claims

1. A process for forming a polymeric gel having improved creep resistance at elevated temperatures, a viscosity of at least about 100,000 cps which comprise the steps of:

(a) forming a solvent system of an organic liquid, a free radical generating initiator, and a water miscible cosolvent, said polar cosolvent being less than about 15 wt. % of said solvent system, a viscosity of said solvent system being less than about 1,000 cps;

(b) dissolving a neutralized sulfonated polymer in said solvent system to form a solution, a concentration of said neutralized sulfonated polymer in said solution being about 0.1 to about 10 wt. %, a viscosity of said solution being less than about 20,000 cps;

(c) adding a free radical generating initiator to the solution at a level of about 0.01 to about 1%;

(d) adding under high shear about 5 to about 500 volume % water to said solution, said water being immiscible with said solution, with said water miscible cosolvent transferring from said solution to said water causing the viscosity of said solution or suspension to increase from less than 20,000 cps to greater than 100,000 cps.

4,412,029

ELASTOMERIC COMPOSITION FOR PROVIDING ELECTRICAL STRESS CONTROL

Dieter Kehr, Hamburg, and Manfred Viebranz, Neu-Wulmstorf, both of Fed. Rep. of Germany, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 2, 1981, Ser. No. 239,539
Int. Cl.³ C08L *83/04, 23/16*
U.S. Cl. 524—441 18 Claims

1. A permanently elastic dielectric composition for influencing electrical fields in power current and high voltage systems, comprising a permanently resilient dielectric base material, a finely divided effect material to increase the relative dielectric constant, comprising strongly structurized dust-fine particles of an electrically polarizable material of low electrical conductivity, in sufficient concentration, but less than about 3 O parts per hundred parts of said base material, to provide, within the range composition in combination:

(a) An electric volume resistivity of at least about 10^6 ohn cm at room temperature,

(b) A relative dielectric constant between about 30 to about 300,

(c) A dielectric loss factor of less than about 1.5,

and a content of a supplemental effect material comprising finely divided particles possessing metal conductivity, in sufficient concentration to maintain the relative dielectric constant at not less than about 20 at high power frequencies.

4,412,030

HOT MELT ADHESIVE COMPOSITIONS EMPLOYING RESINS BASED ON 2-METHYL STYRENE, STYRENE AND A PHENOL

Yves Runavot, St. Maur des Fosses; Georges Billault, Saint Quen, and Jaques Salvetat, Le Vesinet, all of France, assignors to National Starch and Chemical Corporation, Bridgewater, N.J.

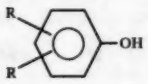
Continuation-in-part of Ser. No. 191,466, Aug. 25, 1980, Pat. No. 4,357,459. This application Apr. 30, 1982, Ser. No. 373,585

Int. Cl.³ C08L *101/06*

U.S. Cl. 524—505 **9 Claims**

1. A hot melt adhesive composition comprising:

(a) a first resin having an average molecular weight of 400 to 2,000, based on α-methyl styrene, stryene and a phenol as constitutents, characterized in that the weight percentages of α-methyl styrene, styrene and a phenol with a structural formula



in which R is hydrogen or a C_1–C_{12} alkyl group, which compounds are substantially the sole constituents, range from 25 to 63, from 35 to 73 and from 2 to 15 parts by weight of the resin, respectively; and

(b) a second resin selected from the group consisting essentially of copolymers of ethylene vinyl acetate containing 25–65% vinyl acetate, atactic polypropylene, ethylacrylate copolymers, natural rubbers and synthetic rubbers.

4,412,031

MODIFIED RUBBER COMPOSITION EMPLOYING A COMPOUND CONTAINING A CARBOXYL AND AN ALDEHYDE GROUP

Shizuo Kitahara, Kawaguchi; Yoshitsugu Hirokawa, Yokohama; Haruki Kawada, Yokohama; Toshihiro Fujii, Yokohama; Nagatoshi Sugi, Yokohama; Hiroaki Hasegawa, Yokohama, and Akira Yoshioka, Kamakura, all of Japan, assignors to Nippon Zeon Co., Ltd., Tokyo, Japan

Filed Feb. 18, 1983, Ser. No. 467,764

Int. Cl.³ C08F *8/28*; C08K *3/04*

U.S. Cl. 524—526 **32 Claims**

1. A modified rubber composition comprising a blend of (a) a modified rubber obtained by reaction a rubber having an unsaturated carbon linkage with an organic compound having a carboxyl group and an aldehyde group in the presence of an acid catalyst, and (b) carbon black.

4,412,032

SILICONIZED POLYETHER THERMOSETTING COATING COMPOSITIONS

Joseph E. Gaske, Mt. Prospect; Thomas H. Plaisance, Wilmette, and Kazys Sekmakas, Palatine, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 268,633, May 29, 1981, Pat. No. 4,370,441. This application Apr. 28, 1982, Ser. No. 372,244

Int. Cl.³ C08L *67/02*

U.S. Cl. 524—538 **9 Claims**

1. An organic solvent solution coating composition adapted to deposit a thermosetting weather-resistant coating comprising three essential resin components, as follows:

(1) an essentially nonfunctional organic solvent-soluble silicone resin reaction product of a low molecular weight hydroxy functional polyether with an hydroxy or alkoxy-functional organic polysiloxane, said polyether having an average molecular weight in the range of 300 to 4000 and an hydroxy functionality of at least about 3, said polysiloxane being present in an amount of from 8% to 20% of the weight of the three resin components, and said polyether and said polysiloxane being combined in approximately stoichiometric proportions;

(2) a reactive organic solvent-soluble essentially linear high molecular weight hydroxy functional polyester, said hydroxy functionality being present in an amount to provide a thermoset film by reaction with aminoplast resin, said reactive polyester constituting the balance of the three resin components; and

(3) from 3% to 15%, based on the weight of the three resin components, of a heterocyclic aminoplast resin for curing said reactive polyester, said components 1 and 2 being compatible in the solution and at least partially incompatible in a film as the solvent evaporates, so that components 2 and 3 can cure in a deposited film and adhere the coating to a metal substrate, and component 1 can concentrate at the surface to enhance the weather resistance which is obtained when a deposited coating is baked.

4,412,033

ONE-PART, CURABLE POLYURETHANE

Stanley B. LaBelle, Anoka, and James A. E. Hagquist, St. Paul, both of Minn., assignors to H. B. Fuller Company, St. Paul, Minn.

Continuation of Ser. No. 200,572, Oct. 24, 1980, abandoned. This application Sep. 13, 1982, Ser. No. 417,021

Int. Cl.³ C08G *18/10*

U.S. Cl. 524—590 **34 Claims**

1. A one-part, isocyanate-capped prepolymer composition stable for at least about 48 hours at normal ambient temperature and pressure and curable at temperatures above 60° C. to a solid polymer with at least twice the molecular weight of said prepolymer, said prepolymer composition comprising:

(a) in a continuous phase, an aliphatic or cycloaliphatic polyisocyanate-capped prepolymer which is fluid at temperatures above 60° C., has a molecular weight in excess of 250, and contains a chain of repeating units selected from the group consisting of oxyalkylene, ester, or mixtures thereof; and, uniformly distributed through said continuous phase,

(b) a phase comprising a solid, finely divided polyol of the formula

$$(ROCH_2)_3C—CH_2OCH_2C(CH_2OR)_2]_nCH_2OR$$

wherein

R represents hydrogen or an aliphatic, cycloaliphatic or aromatic acyl radical, provided that more than one of the R groups is hydrogen, and

n is a number ranging from zero to two;

said polyol being at least partially incompatible with said prepolymer at temperatures below about 60° C., wherein the presence of the solid finely divided polyol reduces the

ratio of NCO groups to OH groups in the total composition from greater than 1.5:1 to about 0.8:1–1.5:1; and

(c) distributed through said continuous phase, an organometallic or metal salt catalyst for the reaction between isocyanate radicals and the free hydroxyl groups of said component (b).

4,412,034

CROSS-LINKABLE SATURATED POWDEROUS COMPOSITIONS AND POWDEROUS PAINTING AND COATING COMPOSITIONS CONTAINING SAME

Jacques Meyer, Paris, and Daniel Bernelin, Ris-Orangis, both of France, assignors to Chloe Chimie, Puteaux, France

Division of Ser. No. 24,008, Mar. 26, 1979, Pat. No. 4,284,745, which is a division of Ser. No. 833,953, Sep. 16, 1977, Pat. No. 4,182,840. This application May 20, 1981, Ser. No. 265,400

Claims priority, application France, Sep. 22, 1976, 76 28415; May 9, 1977, 77 14039; Jul. 11, 1977, 77 21240

Int. Cl.³ C08G *63/76, 18/80*

U.S. Cl. 524—791 **40 Claims**

1. A powderous composition of matter useful in preparing coatings having a non-glossy surface consisting essentially of;

(a) at least one cross-linkable saturated polyester resin;

(b) a cross-linking agent comprising masked isocyanate groups in an amount sufficient to cross-link said resin; and

(c) a catalytic amount of a salt of an at least bivalent metal ion and an organic acid anion selected from carboxylic and acetylacetonate anions.

30. A composition of matter useful in preparing coatings having a non-glossy surface comprising:

(a) at least one cross-linkable saturated polyester resin which is a co-condensation product of a carboxylic acid component comprising at least one aromatic dicarboxylic acid and an alcohol component comprising at least one diol;

(b) a cross-linking agent comprising masked isocyanate groups in an amount sufficient to cross-link said resin;

(c) a catalytic amount of a salt of an at least bivalent metal cation and an organic acid anion selected from carboxylic and acetylacetonate anions; and,

(d) at least one derivative of the polyester resin which is infusible at 150° C., which is a crystalline fraction of a crystallizable saturated polyester or a cross-linked reaction product of the saturated polyester and the cross-linking agent.

4,412,035

SILICONE EMULSION COMPOSITION

Akitsugu Kurita, Ohta, Japan, assignor to Toshiba Silicones Ltd., Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,488

Int. Cl.³ C08K *3/02, 3/16, 3/28*

U.S. Cl. 524—796 **5 Claims**

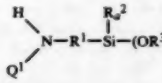
1. A silicone emulsion composition obtained by emulsion-polymerizing:

(I) 0.1–60 weight percent of a reaction product of:

(A) 50–99.9 weight percent of a polydiorganosiloxane having at least one silanol group in the molecule and a viscosity at 25° C. of 5–10,000 cSt, and

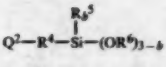
(B) 0.1–50 weight percent of a product obtained by reacting:

(a) 1 mole of a compound of the formula:



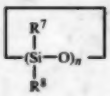
wherein Q^1 represents a monovalent group selected from the group consisting of hydrogen atom, $-CH_3$, $-CH_2CH_2NH_2$ and $-CH_2CH_2NHCH_2CH_2NH_2$, R^1 represents a divalent hydrocarbon group having 1–4 carbon atoms, R^2 and R^3 each represent a monovalent hydrocarbon group having 1–4 carbon atoms and a represents an integer of 0 or 1, with

(b) 0.5–3.0 mole of a compound of the formula:



wherein Q^2 represents an epoxy group-containing group selected from the group consisting of glycidoxy and epoxycyclohexyl groups, R^4 represents a divalent hydrocarbon group having 2–4 carbon atoms, R^5 and R^6 each represent a monovalent hydrocarbon group having 1–4 carbon atoms and b represents an integer of 0 or 1, with

(2) 1–50 weight percent of a compound of the formula:



wherein R^7 and R^8 may be the same or different and each represent a substituted or unsubstituted hydrocarbon group having 1–50 carbon atoms and n represents an integer of at least 3, in the presence of:

(3) 0.1–20 weight percent of a quaternary ammonium salt surfactant, and

(4) 20–90 weight percent of water.

4,412,036

COMPOSITION FOR ABSORBENT FILM AND METHOD AND PREPARATION

Lee C. Pedersen, Delano, and Lyle F. Elmquist, St. Paul, both of Minn., assignors to Grain Processing Corporation, Muscatine, Iowa

Filed Aug. 5, 1981, Ser. No. 290,385

Int. Cl.³ C08L *33/20*

U.S. Cl. 525—54.26 **6 Claims**

1. An absorbent composition useful in preparing an absorbent film in which the absorbent composition is secured to at least one backing layer by exposing the same to effective heat and pressure conditions, said absorbent composition comprising the reaction product of hydrolyzed starch polyacrylonitrile graft copolymer and a polyhydric alcohol in which, based upon the total weight of the composition, said hydrolyzed starch polyacrylonitrile graft copolymer is present in an amount of about 80% to 97% by weight and said polyhydric alcohol is present in an amount of about 20% to 3% by weight.

4,412,037

THERMOPLASTIC MOLDING MATERIALS

Franz Brandstetter, Neustadt; Adolf Echte, Ludwigshafen; Hermann Gausepohl, Mutterstadt, and Herbert Naarmann, Wattenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Filed Sep. 14, 1981, Ser. No. 302,040

Claims priority, application Fed. Rep. of Germany, Sep. 20, 1980, 3035560

Int. Cl.³ C08L *61/04*

U.S. Cl. 525—68 **4 Claims**

1. A thermoplastic molding material based on a blend of impact-resistant styrene polymers in which the soft components of the polymers have different particle sizes and on polyphenylene ethers, wherein the particles of the soft component of the impact-resistant styrene polymers have a mean diameter of more than 1 micron, which soft component is the part of the impact-resistant styrene polymer which is insoluble in toluene at 25° C., minus any pigments present, and wherein the proportion of particles of the soft component of the poly-

mers which have a diameter of less than 0.6 micron is not less than 40% by weight and the proportion of particles of the soft component of the polymers which have a diameter of from 0.6 to 3 microns is less than 3% by weight.

4,412,038

LOW MOLECULAR WEIGHT 1,3-BUTADIENE POLYMERS CONTAINING REACTIVE SILYL GROUPS, WHICH ARE STABILIZED AGAINST CROSSLINKING

Dieter Zerpner, and Roland Streck, both of Marl, Fed. Rep. of Germany, assignors to Chemische Werke Huels AG, Marl, Fed. Rep. of Germany

Filed Aug. 4, 1982, Ser. No. 405,010

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1981, 3130928

Int. Cl.³ C08F *8/00*

U.S. Cl. 525—101 **5 Claims**

1. In a 1,3-butadiene polymer having an average molecular weight (Mn) of 400–4,000 and having bound silyl groups of the formula —SiXYZ wherein X is alkoxy of 1–6 carbon atoms, and Y and Z independently are an X group, hydrogen, alkyl of 1–8 carbon atoms, cycloalkyl 5–12 carbon atoms, phenyl, or phenyl substituted of halogen or alkyl of 6–12 total carbon atoms, the improvement wherein there is combined therewith 0.01–20% by weight of the total combination of an epoxy compound having an epoxy oxygen content of 2–17% by weight.

4,412,039

CROSSLINKED SILICONE-VINYL POLYMER SYSTEMS

Heinrich Alberts; Hans Friemann; Hans-Heinrich Moretto, all of Cologne; Hans Sattlegger, Odenthal, and Fritz Mietzsch, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 17, 1981, Ser. No. 284,295

Claims priority, application Fed. Rep. of Germany, Aug. 9, 1980, 3030195

Int. Cl.³ C08L *83/10*

U.S. Cl. 525—106 **8 Claims**

1. A co-grafted polymer dispersion comprising blocks of an organopolysiloxane with OH functional groups, blocks of an ethylene/vinyl ester copolymer containing about 5 to 99% by weight of incorporated vinyl ester, and blocks of vinyl monomer units polymerized in the presence of mixtures of the organopolysiloxane and ethylene/vinyl ester copolymer, the organopolysiloxane and ethylene/vinyl ester copolymer blocks being linked via vinyl polymer bridges, the OH-terminated organopolysiloxane blocks constituting 10–90% and the vinyl monomer blocks constituting 5–85% of the weight of the recited blocks.

4,412,040

LOW MOLECULAR WEIGHT COPOLYMER SALTS AS LUBRICANTS IN PLASTICS

Paul J. Albee, Jr., Bensalem, Pa.; Patricia E. Burdick, Lake Hiawatha, and Joseph I. Wrozina, Tenafly, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 2, 1981, Ser. No. 222,197

Int. Cl.³ C08L *33/02*

U.S. Cl. 525—143 **43 Claims**

1. A composition comprising:

a polymer selected from the group consisting of: polyolefins; styrene based polymers; polyamides; polyesters; polycarbonates; polyvinyl chloride; copolymers of acrylonitrile, butadiene, stryrene; and phenolic resins; and

up to 10 parts per hundred of the polymer of a lubricant which comprises a copolymer salt of a copolymer of an alpha-olefin and an alpha,beta-ethylenically unsaturated carboxylic acid, the copolymer acid having a number average molecular weight between about 500 and about 5000, the copolymer acid having up to 100% of the carboxylic acid groups neutralized with at least one cation from the group consisting of metallic cations having a valence of 1 to 3.

4,412,041

PROCESS FOR MODIFYING RUBBERS EMPLOYING A COMPOUND CONTAINING A CARBOXYL AND AN ALDEHYDE GROUP

Shizuo Kitahara, Kawaguchi; Yoshitsugu Hirokawa, Yokohama; Haruki Kawada, Yokohama; Toshihiro Fujii, Yokohama; Nagatoshi Sugi, Yokohama; Hiroaki Hasegawa, Yokohama, and Akira Yoshioka, Kamakura, all of Japan, assignors to Nippon Zeon Co. Ltd., Tokyo, Japan

Filed Feb. 18, 1983, Ser. No. 467,765

Claims priority, application Japan, Feb. 19, 1982, 57-25476

Int. Cl.³ C08F *8/28*

U.S. Cl. 525—154 **15 Claims**

1. A process for modifying a rubber, which comprises reacting a rubber having an unsaturated carbon linkage with an organic compound having a carboxyl group and an aldehyde group in the presence of an acid catalyst.

4,412,042

PROCESS FOR PREPARING POLYOLEFINS CROSS-LINKED BY SILANE LINKAGE

Kazuo Matsuura, Tokyo; Noboru Yamaoka, Yokohama, and Mituji Miyoshi, Fujisawa, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Filed Mar. 8, 1982, Ser. No. 356,004

Claims priority, application Japan, Mar. 19, 1981, 56-38758

Int. Cl.³ C08F *255/02, 255/04, 255/08, 255/10*

U.S. Cl. 525—260 **18 Claims**

1. In a process for preparing a polyolefin crosslinked by silane linkage by contacting a polyolefin modified with silane with water in the presence of a silanol condensation catalyst, an improved process wherein said polyolefin modified with silane is a reaction product produced by reacting an ethylene/α-olefin copolymer having a density of from 0.850 to 0.910 with a silane compound in the presence of a free radical generating agent, said ethylene/α-olefin copolymer being prepared by copolymerizing ethylene with an α-olefin having 3 to 12 carbon atoms in a vapor phase with substantially no solvent present and in the presence of a catalyst comprising an organoaluminum compound and a solid substance containing magnesium and a metal selected from the group consisting of titanium, vanadium and mixtures thereof.

4,412,043

VULCANIZABLE ETHYLENE COPOLYMERS

Jose F. Pazos, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 3, 1982, Ser. No. 374,615

Int. Cl.³ C08F *8/32*

U.S. Cl. 525—328.2 **10 Claims**

1. A vulcanizable elastomeric copolymer consisting essentially of copolymerized units of:

(a) 20–75 weight percent of a comonomer selected from the group consisting of methyl acrylate, methyl methacrylate, ethylacrylate and ethyl methacrylate,

(b) 0.15–0.5 mole of a cure-site monomer selected from the group consisting of 4-(dialkylamino)-4-oxo-2-butenoic acid per kilogram of copolymer, wherein the alkyl moiety is C_1–C_{12} alkyl substituted with 0–2 C_6–C_{12} aryl groups, and

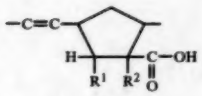
(c) a complemental amount of ethylene from 15–60 weight percent.

4,412,044
RING-OPENED NORBORNYL POLYMERS

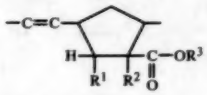
Hiroshi Takahashi, and Katsuhiro Abe, both of Yokkaichi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo, Japan

Filed Mar. 23, 1982, Ser. No. 360,908
Claims priority, application Japan, Mar. 27, 1981, 56-44923
Int. Cl.³ C08F 8/12
U.S. Cl. 525—329.5 13 Claims

1. A polymer which consists essentially of receiving structural units (A) represented by the following formula,



and receiving structural units (B) represented by the following formula,



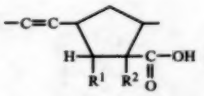
wherein R^1 stands for hydrogen atom, an alkyl group or a phenyl group, R^2 stands for hydrogen atom or an alkyl group, and R^3 stands for an alkyl group, and which also satisfies the following requirements (a) through (c);

(a) the intrinsic viscosity of the polymer being in the range of 0.3 to 4.0,

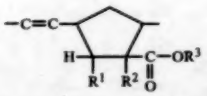
(b) the content of the structural unit (A) being 10 to 90 mol % of the total structural units, and

(c) the trans-form content of the double bonds in the structural units (A) and (B) being 40% or more.

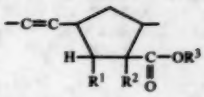
8. A process for preparation of a polymer which consists essentially of receiving structural units (A) represented by the following formula,



and receiving structural units (B) represented by the following formula,



wherein R^1 stands for hydrogen atom, an alkyl group or a phenyl group, R^2 stands for hydrogen atom or an alkyl group, and R^3 stands for an alkyl group wherein the unit (A) comprises 10 to 90% of the units (A) and (B), which comprises treating with an aqueous alkali solution a ring-opened polymer having recurring units of the following formula wherein the trans-form content of the double bonds is 40% or more and then treating the resulting polymer with an acid,



wherein R^1 stands for hydrogen atom, an alkyl group or a phenyl group, R^2 stands for hydrogen atom or an alkyl group, and R^3 stands for an alkyl group.

4,412,045
COLOR DEVELOPER FOR PRESSURE-SENSITIVE COPYING PAPER

Toyoji Kikuga, and Koji Hirai, both of Fujieda, Japan, assignors to Sumitomo Durez Company, Ltd., Shizuoka, Japan

Continuation of Ser. No. 173,562, Jul. 30, 1980, which is a division of Ser. No. 847,519, Nov. 1, 1977, Pat. No. 4,216,300. This application Jan. 25, 1982, Ser. No. 342,537
Claims priority, application Japan, Nov. 4, 1976, 51-131672
The portion of the term of this patent subsequent to Aug. 5, 1997, has been disclaimed.
Int. Cl.³ C08L 61/06, 61/08, 61/12, 61/34
U.S. Cl. 525—501 42 Claims

1. A color developer for pressure-sensitive copying paper which comprises a mixture of:

(1) a para-substituted difunctional phenol-aldehyde condensate, and

(2) a tri- or higher functional phenol-aldehyde condensate.

4,412,046
TRANSPARENCIES PRODUCED FROM EPOXY RESINS CURED WITH ADDUCTS OF TRIMETHOXYBOROXINE AND BENZYL ALCOHOL AND INTERLAYERS OF MERCAPTAN RESINS

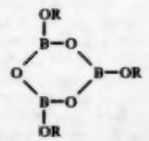
John R. Uram, Jr., Glendale, Ariz., assignor to Goodyear Aerospace Corporation, Akron, Ohio

Division of Ser. No. 204,424, Nov. 6, 1980, Pat. No. 4,352,848, which is a continuation-in-part of Ser. No. 70,390, Aug. 28, 1979, Pat. No. 4,294,886. This application May 12, 1982, Ser. No. 377,275
The portion of the term of this patent subsequent to Oct. 13, 1998, has been disclaimed.
Int. Cl.³ C08G 59/62, 59/40
U.S. Cl. 525—506 8 Claims

1. A transparent composition having resistance to intense heat, comprising:

(a) a transparent blend having from about 80 parts to about 100 parts by weight of an epoxy resin;

(b) from about 5 to about 30 parts by weight of a boroxine having the formula:



where R is a group having from 2 to 18 carbon atoms; and

(c) from 1 part to about 10 parts by weight of a phenyl substituted alkyl alcohol; said alkyl alcohol having from 1 to 20 carbon atoms.

4,412,047
CYCLOALIPHATIC DIEPOXIDE, ITS PREPARATION AND ITS USE

Charles E. Monnier, Basel, and Friedrich Lohse, Oberwil, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 20, 1982, Ser. No. 419,690

Claims priority, application Switzerland, Oct. 1, 1981, 6352/81

Int. Cl.³ C08G *59/24;* **C07** *303/10*

U.S. Cl. 525—507 **6 Claims**

1. 1,5-Dimethyl-1,2;5,6-diepoxycyclooctane.

6. A curable mixture containing 1,5-dimethyl-1,2:5,6-diepoxycyclooctane according to claim 1 and a curing agent for epoxide resins and optionally a further epoxide resin.

4,412,048
SOLVENTLESS UV DRYABLE B-STAGEABLE EPOXY ADHESIVE

George D. Dixon; Nancy W. Carlson, both of Needham, Mass., and Howard E. Saunders, Murrysville, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Sep. 11, 1981, Ser. No. 301,169

Int. Cl.³ C08L *63/00, 63/02*

U.S. Cl. 525—524 **16 Claims**

1. A solventless, UV-dryable, B-stageable, epoxy adhesive comprising:

(A) about 40 to about 70 pbw of a solid thermally curable epoxy having a molecular weight between about 650 to about 4,000;

(B) a thermal curing agent for said thermally curable epoxy, stable at room temperature and soluble in said adhesive, in an amount from about stoichiometric to about 50% by weight in excess of stoichiometric;

(C) up to about 2 pbw of an accelerator for said thermal curing agent, soluble in said adhesive;

(D) about 25 to about 60 pbw of a liquid UV curable epoxy resin in which said solid thermally curable epoxy is soluble;

(E) about 1 to about 10 pbw of a UV photoinitiator for said UV curable epoxy resin; and

(F) up to about 20 pbw of a reactive diluent;

(G) up to about 5 pbw of a flow control agent;

(H) up to about 1 pbw of a surfactant; and

(I) about 2 to about 10 pbw of a tri or higher functional epoxy.

4,412,049
PROCESS FOR PRODUCING HIGHLY STEREOREGULAR α-OLEFIN POLYMERS

Akinobu Shiga; Yukio Naito; Toshio Sasaki; Junpei Kojima, and Hiroshi Yoshioka, all Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Continuation-in-part of Ser. No. 300,694, Sep. 10, 1981, abandoned. This application Jan. 10, 1983, Ser. No. 456,560

Claims priority, application Japan, Sep. 29, 1980, 55-136067; Sep. 29, 1980, 55-136068; Sep. 29, 1980, 55-136069; Sep. 29, 1980, 55-136070; Sep. 29, 1980, 55-136072; Sep. 29, 1980, 55-136073; Sep. 29, 1980, 55-136074

Int. Cl.³ C08F *4/02, 10/06*

U.S. Cl. 526—127 **41 Claims**

1. A process for producing α-olefin polymers of high stereoregularity which comprises polymerizing an α-olefin having not less than three carbon atoms or copolymerizing said α-olefin with another olefin having not less than two carbon atoms in the presence of a catalyst system comprising:

(A) a solid catalyst obtained by contact reaction between

(a) a solid product prepared by reaction of an organo-magnesium compound with at least one of the following halogen-containing compounds (I) and (II) in a solvent comprising an ether compound or a mixture of an ether compound and a hydrocarbon compound,

(I) halogenated silicon compounds of the formula, R_nSiX_{4-n}, in which R is a hydrocarbon group having 1 to 8 carbon atoms, X is a halogen atom and n is a number satisfying $0 \leqq n < 4$,

(II) halogenated aluminum compounds of the formula, R_lAlX_{3-l}, in which R is a hdyrocarbon group having 1 to 8 carbon atoms, X is a halogen atom and l is a number satisfying $0 \leqq l < 3$, and

(b) a titanium compound of the formula, $Ti(OAr)_nX_{4-n}$, in which OAr is an aryloxy group, X is halogen, n is a number satisfying $0.1 \leqq n \leqq 0.8$, the ratio of the number of titanium-aryloxy linkage to that of titanium is less than 1, and the valence of titanium is 4, and (B) an organoaluminum compound as an activating agent.

4,412,050
LINEAR POLYMERS FROM BLOCKED VINYL BIPHENYL COMPOUNDS

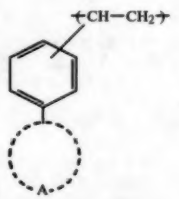
Avinash C. Mehta, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jan. 5, 1981, Ser. No. 222,361

Int. Cl.³ C08F *28/04, 24/00, 16/22*

U.S. Cl. 526—266 **9 Claims**

1. A linear polymer comprising recurring units of the formula



wherein the recurring vinyl grouping is in the 3'- or 4'-position and the cyclic moiety A is a 2,5-; -2,3-; or -3,4¹di-OR-1-phenyl moiety wherein R is a hydroxy-proteeting group capable of being removed so as to regenerate the hydroxy group.

4,412,051
BROMINE-CONTAINING POLYMER AND PROCESS OF PREPARING A BROMINE-CONTAINING POLYMER

Hendrikus C. J. de Man, Geleen, and Petrus T. J. L. Smids, Maastricht, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Continuation of Ser. No. 100,329, Dec. 5, 1979, abandoned. This application Jul. 21, 1981, Ser. No. 285,511

Claims priority, application Netherlands, Dec. 22, 1978, 7812460

Int. Cl.³ C08F *12/16*

U.S. Cl. 526—293 **8 Claims**

1. A process of preparing a bromine-containing copolymer comprising adding 25 to 100 parts by weight of bromostyrene, continuously or in batches, to an aqueous emulsion of 5 to 40 parts by weight of acrylonitrile, and an emulsifier, conducting the polymerization reaction in the presence of an initiator providing water-soluble free radicals and after completion of the polymerization yielding a copolymer product having 60 to 95% by weight of copolymerized bromostyrene therein and having a weight-average molecular weight in the range of 25,000 to 2,000,000.

4,412,052

MOISTURE PERMEATION RESISTANT RESINS FROM EPOXY RESINS, POLYMERCAPTANS, AND AMINOSILANES

John R. Uram, Jr., Glendale, Ariz., assignor to Goodyear Aerospace Corporation, Akron, Ohio

Division of Ser. No. 204,424, Nov. 6, 1980, Pat. No. 4,352,848, which is a continuation-in-part of Ser. No. 70,390, Aug. 28, 1979, Pat. No. 4,294,886. This application May 12, 1982, Ser. No. 377,274

The portion of the term of this patent subsequent to Oct. 5, 1999, has been disclaimed.

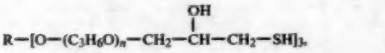
Int. Cl.³ C08G *59/40, 77/26*

U.S. Cl. 528—27 8 Claims

1. A composition resistant to moisture permeation comprising:

a blend having,

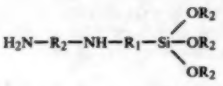
(a) about 100 parts by weight of a mercaptan compound having the following formula:



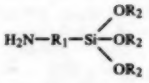
where R is an aliphatic hydrocarbon group having from 1 to 18 carbon atoms and where n is 1 or 2;

(b) from about 40 to about 250 parts by weight of an epoxy resin; and

(c) from about 0.5 parts by weight to about 4.0 parts by weight of a silane selected from the group consisting of: N-aminoalkyl-aminoalkyl-trialkoxysilanes of the formula:



wherein R_1 is an alkylene having 1–6 carbon atoms and R_2 is an alkyl, having 1–6 carbon atoms; and aminoalkyl-trialkoxysilanes of the formula:



wherein R_1 and R_2 are as defined above, and combinations thereof.

4,412,053

POLYPHOSPHAZENE COMPOUNDS AND METHOD OF PREPARATION

Robert H. Neilson, and Patty J. Wisian-Neilson, both of 6513 Lawndale Dr., Forth Worth, Tex. 76134

Continuation of Ser. No. 232,518, Feb. 9, 1981, abandoned. This application Jan. 22, 1982, Ser. No. 341,689

Int. Cl.³ C08G *73/00*

U.S. Cl. 528—30 3 Claims

1. A method of preparing a polyphosphazene having a phosphorus-nitrogen backbone and side units bonded to the backbone by direct carbon-phosphorus bonds, comprising the steps of:

reacting a disilylaminophosphine starting material with bromine to produce a P-bromo-N-silylphosphinimine;

reacting the P-bromo-N-silylphosphinimine so produced with trifluoroethanol in the presence of triethylamine to produce a trifluoroethoxy substituted N-silylphosphinimine; and

heating the trifluoroethoxy substituted N-silylphosphinimine in the range of 150°-250° C.

4,412,054

ANTITHROMBOGENIC POLYURETHANES BASED ON FLUORINATED PREPOLYMERS

Masaaki Yamabe, Machida; Masao Kato, and Teruo Takakura, both of Yokohama, all of Japan, assignors to Asahi Glass Company Ltd., Tokyo, Japan

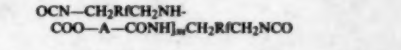
Filed Aug. 17, 1982, Ser. No. 408,936

Claims priority, application Japan, Sep. 4, 1981, 56-138640

Int. Cl.³ C08G *18/77, 18/48, 18/50*

U.S. Cl. 528—70 3 Claims

1. An antithrombogenic material which is composed of a fluorine-containing block polymer obtained by the polyaddition or polycondensation of a prepolymer with a chain extender, said prepolymer being a diisocyanate prepolymer represented by the formula



(I)

where Rf is a perfluoroalkylene or perfluoroxyalkylene group having from 1 to 20 carbon atoms and containing from 0 to 10 ether linkages, A is a divalent organic group containing an oxygen atom in its main chain and m is from 1 to 3, or a dicarbamate prepolymer obtained by reacting the diisocyanate prepolymer with a lower alcohol.

4,412,055

EPOXY RESINS PREPARED FROM EPIHALOHYDRINS AND HYDROXYL-CONTAINING PHOSPHONOPOLYESTER OLIGOMERS

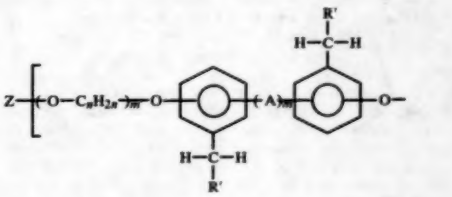
Robert E. Hefner, Jr., Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

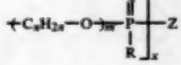
Continuation of Ser. No. 330,106, Dec. 14, 1981. This application Sep. 27, 1982, Ser. No. 423,905

Int. Cl.³ C08G *59/06*

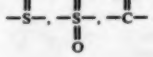
U.S. Cl. 528—99 4 Claims

1. An epoxy resin prepared by dehydrohalogenating the reaction product of an epihalohydrin and at least one oligomer containing hydroxyl groups having recurring units represented by the following general formula





wherein each A is independently —O—, —S—, —S—S—,



or a divalent hydrocarbon group having from 1 to about 8 carbon atoms; each Q is independently oxygen or sulfur; each R is independently a hydrocarbon group having from about 1 to about 10 carbon atoms; each R' is independently a —CH=CH_2 group or a —CXH—CXH_2 group, wherein X is chlorine or bromine; each Z is independently a terminal moiety; each m is independently zero or one; each m' indepen-

dently has a value from 1 to about 5; each n independently has a value of 2, 3 or 4; and x has an average value of from 1 to about 10.

4,412,056

POLYGLYCIDYL ETHERS, THEIR PREPARATION AND USE IN CURABLE COMPOSITIONS

Johan van Gogh, and Hermanus Grol, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

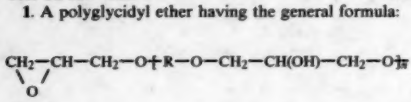
Filed Nov. 10, 1982, Ser. No. 440,647

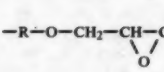
Claims priority, application United Kingdom, Dec. 22, 1981, 8138505

Int. Cl.³ C08G 59/24

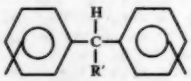
U.S. Cl. 528—112 **8 Claims**

1. A polyglycidyl ether having the general formula:





wherein n is a number of from 0 to 12 and R is the hydrocarbon residue of a diphenylol alkane from 1 to (n+1) groups R in the above molecule have the formula:



wherein R′ is a C_7 to C_{12} alkyl group.

4,412,057

PROCESS FOR MANUFACTURING AROMATIC POLYESTERS

Masahiro Asada, Kobe; Miyuki Matsuura, Nishinomiya, and Kazuya Yonezawa, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Dec. 16, 1981, Ser. No. 331,463

Int. Cl.³ C08G 63/18, 63/24

U.S. Cl. 528—179 **12 Claims**

1. In a process for manufacturing an aromatic polyester by reacting an aromatic dicarboxylic acid dichloride with an alkali metal salt of a bisphenol in an aqueous solution, the improvement which comprises adding 0.01 to 100 mol%, based on the total monomer quantity, of an acid monohalide into the reaction system at a time when the conversion degree is not lower than 50%.

4,412,058

AROMATIC POLYESTERS AND HIGH STRENGTH FILAMENTS THEREOF

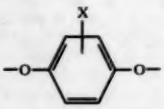
Roger K. Siemionko, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 384,343, Jun. 2, 1982. This application Feb. 7, 1983, Ser. No. 464,428

Int. Cl.³ C08G 63/18, 63/60

U.S. Cl. 528—191 **8 Claims**

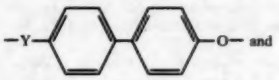
1. A polyester consisting essentially of units having structural formulas as follows:



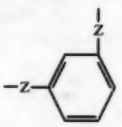
I.

-continued

II.



III.



IV.

where X is chloro or methyl; Y is either carbonyl or oxy and each Z is independently selected from the group consisting of oxy and carbonyl; unit I is present in the amount of from about 30 to 45 mol percent, unit II is present in the amount of from about 30 to 50 mol %, unit III is present in the amount of from about 5 to 20 mol percent and unit IV is present in the amount of from about 2 to 15 mol percent with the total dioxy aryl units and the total dicarbonyl aryl units being present in substantially equimolar amounts.

4,412,059

HIGH MODULUS CHOLESTERIC MESOPHASE POLYMERS

William R. Krigbaum; Alberto Ciferri, both of Durham, and Jack Preston, Raleigh, all of N.C., assignors to Duke University, Durham, N.C.

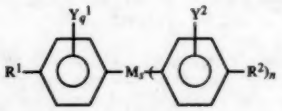
Filed Aug. 20, 1980, Ser. No. 179,962

Int. Cl.³ C08G 69/36, 63/00

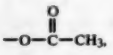
U.S. Cl. 528—192 **20 Claims**

1. A polymeric material which is capable of forming high modulus, biaxially orientable structures of a cholesteric mesophase, wherein said polymeric material comprises an optically active monomer which is condensation co-polymerized with at least one p-phenylene containing monomer which is itself capable of forming a polymer exhibiting a nematic mesophase, or which is capable of being copolymerized with a second monomer to form a nematic mesophase, or which is capable of being copolymerized with a racemic mixture of said optically active monomers to form a nematic mesophase herein the resulting copolymer is characterized by a degree of inflexibility sufficient to form a mesophase and wherein said optically active monomer is present in said polymer after copolymerization in an amount sufficient to impart optical activity to said polymer sufficient to form a cholesteric mesophase.

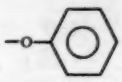
13. The polymer of claim 1 wherein at least one of the monomers capable of forming the nematic phase has the formula



wherein R^1 and R^2 independently represent $-COX^1$, $-NH_2$, $-OH$,



wherein X^1 is -OH, -Cl,



or -Br; n is 0 or 1, q is 1 or 3; wherein if n=0, M is any R' group which may be the same or different than the R' selection, and if n=1 then M is

-CH=CH-, -C(CH$_3$)=CH-, -N=CH-, -N=N- or

Y^1 and Y^2 are independently selected from the group of -H, -Cl, -Br, lower alkyl or -OH; and s may be 0 or 1.

4,412,060

CYCLOALKYL CARBONYL END-CAPPED AROMATIC POLYCARBONATES

Niles R. Rosenquist, Evansville, Ind., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Jun. 9, 1982, Ser. No. 386,740
Int. Cl.^{3} C08G 63/62
U.S. Cl. 528—196 **8 Claims**

1. An aromatic polycarbonate chain terminated with a residue having a structure of the Formula

wherein R is cycloalkyl of four to seven ring carbon atoms, inclusive, or methyl substituted cycloalkyl of four to seven ring carbon atoms, inclusive, wherein from one to three hydrogen atoms of the cycloalkyl group are replaced by a methyl group.

4,412,061

PROCESS FOR THE PREPARATION OF A POLYAMIDE FROM UNSATURATED NITRILE, LACTAM AND WATER

Mu-Yen M. Wu, and Lawrence E. Ball, both of Cuyahoga Falls, Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 24, 1980, Ser. No. 219,782
Int. Cl.^{3} C08G 69/16
U.S. Cl. 528—315 **12 Claims**

1. A process for producing a resinous copolyamide comprising polymerizing an alpha, beta-unsaturated nitrile and water with a molar excess of a lactam.

4,412,062

POLYMER STABILIZATION

Jerry O. Reed, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 25, 1982, Ser. No. 392,040
Int. Cl.^{3} C08G 75/14
U.S. Cl. 528—388 **25 Claims**

1. A resin composition exhibiting improved melt stability and reduced melt viscosity when subjected to heat comprising a poly(arylene sulfide) resin containing an effective amount sufficient to retard resin curing or cross-linking and to reduce polymer melt viscosity of at least one compound chosen from among the classes of compounds consisting essentially of tetraoxaphosphaspiroundecane, 4-hydroxybenzyl isocyanurate, N-hydrocarbylthiophthalimide, and trihydrocarbyl trithiophosphite.

4,412,063

POLYTETRAHYDROFURANS CONTAINING TERMINAL ACRYLATE OR METHACRYLATE GROUPS

Walter Heitz, Kirchhain; Hans-Jürgen Kress, Giessen, and Wolfgang Stix, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 229,094, Jan. 28, 1981, abandoned. This application Apr. 2, 1982, Ser. No. 364,986
Claims priority, application Fed. Rep. of Germany, Feb. 6, 1980, 3004328
Int. Cl.^{3} C07C 67/26; C08G 65/20
U.S. Cl. 528—409 **2 Claims**

1. A process for the production of polytetrahydrofurans, containing terminal acrylate and/or methacrylate groups, wherein tetrahydrofuran, optionally in an inert organic solvent, is homopolymerized at a temperature of from −10° to +70° C., together with 0.1 to 200% by weight, based on the weight of the tetrahydrofuran, of acrylic acid anhydride and/or methacrylic acid anhydride with the aid of from 0.001 to 5.0% by weight, based on tetrahydrofuran, of $HSbF_6$ as catalyst.

4,412,064

METAL ATOM CONTAINING EPOXY RESINS

P. Anthony Hinman, Torrance, Calif., assignor to Armco Inc., Middletown, Ohio

Filed Aug. 9, 1982, Ser. No. 406,343
Int. Cl.^{3} C08G 79/00
U.S. Cl. 528—9 **10 Claims**

1. A metal containing thermosetting epoxy resin obtained by reacting an epoxy resin and one or more metal compounds selected from the following group:

(a) the reaction product of a polyol containing more than two hydroxy groups with boric acid;

(b) the reaction product of a polyol containing more than two hydroxy groups and a metal complex which is the reaction product of tungsten carbonyl with pyrrolidine;

(c) the reaction product of a polyol containing more than two hydroxy groups and a metal complex which is the reaction product of rhenium carbonyl with pyrrolidine;

(d) the reaction product of a polyol containing more than two hydroxy groups and a metal complex which is the reaction product of molybdenum carbonyl with pyrrolidine; and

(e) zirconium acetate.

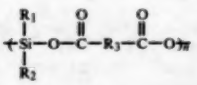
4,412,065

POLY(OXY(SILYLENE) ESTERS)

Charles T. Berge, and Mark P. Mack, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed Jun. 1, 1982, Ser. No. 383,389
Int. Cl.^{3} G08G 77/04
U.S. Cl. 528—26 **14 Claims**

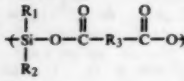
1. Polysilyl esters of the general formula



wherein R_1 and R_2 are, independently, hydrogen, halide, alkyl groups containing from 1 to 30 carbon atoms, cycloalkyl groups, alkaryl groups, aralkyl groups, aryl groups or bicycloalkyl groups, each containing from 6 to 30 carbon atoms,

R_3 is an alkyl group containing from 1 to 30 carbon atoms, a cycloalkyl group, alkaryl group, aralkyl group, aryl group or bicycloalkyl group containing from 6 to 30 carbon atoms and n is greater than 10.

4. A method for the preparation of polysilyl esters having the general formula



wherein R_1 and R_2 are, independently, hydrogen, halide, alkyl groups containing from 1 to 30 carbon atoms, cycloalkyl groups, alkaryl groups, aryalkyl groups, aryl groups or bicycloalkyl groups, each containing from 6 to 30 carbonatoms, R_3 is an alkyl group containing from 1 to 30 carbon atoms, a cycloalkyl group, alkaryl group, aralkyl group, aryl group or bicycloalkyl group containing from 6 to 30 carbon atoms and n is greater than 10 comprising reacting a silicon dihalide, silicon trihalide, silicon tetrahalide, or mixtures of these with a dicarboxylic acid salt or polycarboxylic acid salt in the presence of a phase transfer catalyst.

4,412,066
POLYMER BOUND DYES PREPARED BY DIAZO COUPLING REACTIONS WITH POLY(ORGANOPHOSPHAZENES)

Harry R. Allcock, and Paul E. Austin, both of State College, Pa., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Continuation-in-part of Ser. No. 379,877, May 19, 1982, abandoned. This application Jun. 16, 1982, Ser. No. 389,118

Int. Cl.³ C08G *79/04*

U.S. Cl. 528—168 **7 Claims**

1. A polymer-bound dye prepared by diazotization of a high polymeric polyorganophosphazine $[NP(OC_6H_5)_x(OC_6H_4NH_2\text{-}p)_y]_n$, at about 0° C. in mineral acid solution by addition of alkali metal nitrite in acid solution followed by the addition of a coupling member in alkaline solution at a temperature not greater than about 2° C. to one member of the group consisting of phenol, β-naphthol, 6'-NaO_3S-β-naphthol, and p-aminophenylnaphthalene.

4,412,067
PROCESS FOR THE CONTINUOUS POLYMERIZATION OR COPOLYMERIZATION OF TRIOXANE

Herbert Amann, and Gerhard Morlock, both of Hanau, Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 10, 1982, Ser. No. 448,472

Claims priority, application Fed. Rep. of Germany, Dec. 12, 1981, 3149321

Int. Cl.³ C08G *2/10*

U.S. Cl. 528—232 **12 Claims**

1. A process for the continuous polymerization of trioxane alone or with a copolymerizable monomer in the presence of a cationically active catalyst comprising continuously feeding the starting materials to be polymerized in fluid form into a mixer which serves as the reactor, providing powdered to granular oxymethylene homopolymer or copolymer in the reactor, converting said provided homopolymer or copolymer to a stable fluidized bed by operating said mixer above the critical speed of rotation required to form a fluidized bed, controlling the speed of feeding the materials to be polymerized so that per minute 0.5 to 10 weight percent is supplied based on the total contents of the reactor, selecting the catalyst concentration so that a solidification of the liquid starting material occurs within 20 to 50 seconds after the addition of catalyst, maintaining the temperature of the reactor contents in the range between 60° and 125° C. and discharging polymerizate from the reactor after a polymerization reaction of at least 70%.

4,412,068
NOVEL COMPOUNDS OF THE GENTAMICIN CLASS

David Rosi, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

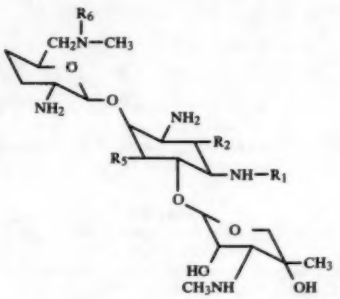
Filed Jun. 8, 1981, Ser. No. 271,552

Int. Cl.³ C07G *11/00*; C12R *1/31*; C07H *15/26*

U.S. Cl. 536—13.6 **5 Claims**

1. A member of the group consisting of

(A) a compound having the formula:



where R_1 is hydrogen or the group, $H_2N(CH_2)_nCHOHCO—$, where n is one of the integers 1 or 2; R_2 and R_5 are either both hydroxy or both hydrogen; and R_6 is hydrogen or methyl, R_2 being hydroxy only when R_6 is methyl; and

(B) acid-addition salts thereof.

4,412,069
PROCESS FOR PREPARING CYCLOPROPANE CARBOXYLIC ACID DERIVATIVES

Jacques Martel, Bondy; Jean Tessier, Vincennes, and Jean-Pierre Demoute, Montreuil-sous-Bois, all of France, assignors to Roussel Uclaf, Paris, France

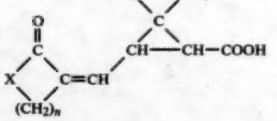
Filed Jul. 17, 1979, Ser. No. 58,273

Claims priority, application France, Jul. 24, 1978, 78 21813

Int. Cl.³ C09B *23/00*

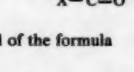
U.S. Cl. 542—429 **8 Claims**

1. A process for the preparation of a compound of the formula

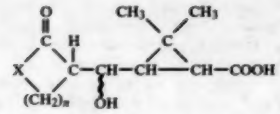


I

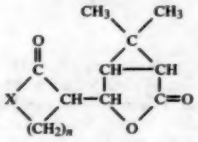
wherein X is selected from the group consisting of oxygen and sulfur and n is 1,2 or 3 comprising reacting in an organic solvent in the presence of a strong base the lactone of cis 2,2-dimethyl-3S-(dihydroxymethyl)-cyclopropane-1R-carboxylic acid with a compound of the formula



to obtain a compound of the formula



reacting the latter with an acid agent in an apolar organic solvent to obtain a compound of the formula



and reacting the latter with a basic agent in an apolar organic solvent to obtain a compound of formula I

4,412,070

CEPHALOSPORIN DERIVATIVES

Roland Reiner, Basel, Switzerland, assignor to Hoffmann-La Roche Inc., Nutley, N.J.

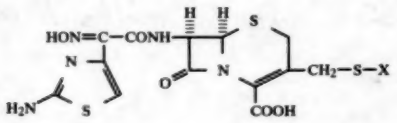
Filed Sep. 28, 1981, Ser. No. 306,053

Claims priority, application Switzerland, Oct. 6, 1980, 7450/80

Int. Cl.³ C07D *501/56*

U.S. Cl. 544—27 **8 Claims**

1. A compound of the formula



I

wherein X is the 1,2,5,6-tetrahydro-2-methyl-5,6-dioxo-as-triazin-3-yl group or its corresponding tautomeric form, the 2,5-dihydro-6-hydroxy-2-methyl-5-oxo-as-triazin-3-yl group, and the readily hydrolyzable esters, readily hydrolyzable ethers and salts thereof and hydrates of the compound of formula I or the esters, ethers and salts thereof.

4,412,071

ANTIATHEROSCLEROTIC COMPOSITIONS

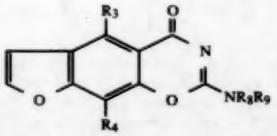
Ronald B. Gammill, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 17, 1982, Ser. No. 378,702

Int. Cl.³ C07D *491/048, 498/04*

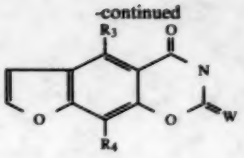
U.S. Cl. 544—58.6 **7 Claims**

1. An antiatherosclerotic compound of formula I, II, or III



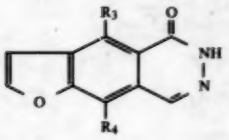
I

-continued



II

or



III

wherein W is oxo (=O) or α-R_1:β-R_2, wherein R_1 and R_2, being the same or different, are individually:

(a) C_1–C_6 alkyl,

(b) trifluoromethyl,

(c) C_5–C_{10} cycloalkyl with the proviso that the cycloalkyl ring is C_5–C_7,

(d) C_2–C_8 alkoxyaminoalkyl,

(e) C_2–C_8 alkoxyalkyl,

(f) C_2–C_8 alkylthioalkyl,

(g) C_2–C_8 alkylsulfinylalkyl,

(h) C_2–C_8 alkylsulfonylalkyl,

(i) C_7–C_{12} phenoxyalkyl optionally substituted on the phenyl ring by one, 2, or 3,
- (i) hydroxy,
- (ii) C_1–C_3 alkoxy,
- (iii) C_1–C_3 alkyl,
- (iv) trifluoromethyl,
- (v) halo which is fluoro, chloro, or bromo, with the proviso that not more than two such substituents are other than alkyl,

(j) C_7–C_{12} phenylthioalkyl optionally substituted on the phenyl ring by one, 2, or 3,
- (i) hydroxy,
- (ii) C_1–C_3 alkoxy,
- (iii) C_1–C_3 alkyl,
- (iv) trifluoromethyl,
- (v) halo which is fluoro, chloro, or bromo, with the proviso that not more than two such substituents are other than alkyl,

(k) phenyl optionally substituted by one, 2, or 3,
- (i) hydroxy,
- (ii) C_1–C_3 alkoxy,
- (iii) C_1–C_3 alkyl,
- (iv) trifluoromethyl,
- (v) halo which is fluoro, chloro, or bromo, with the proviso that not more than two such substituents are other than alkyl,

(l) aralkyl optionally substituted on the aromatic ring by one, 2, or 3,
- (i) hydroxy,
- (ii) C_1–C_3 alkoxy,
- (iii) C_1–C_3 alkyl,
- (iv) trifluoromethyl,
- (v) halo which is fluoro, chloro, or bromo, with the proviso that not more than two such substituents are other than alkyl,

(m) 2- or 3-furanyl optionally substituted by
- (i) hydroxy,
- (ii) C_1–C_3 alkoxy,
- (iii) C_1–C_3 alkyl,
- (iv) trifluoromethyl,
- (v) halo which is fluoro, chloro, or bromo, with the proviso that not more than two such substituents are other than alkyl,

(n) 2- or 3-thenyl optionally substituted by
(i) hydroxy,
(ii) C_1–C_3 alkoxy,
(iii) C_1–C_3 alkyl,
(iv) trifluoromethyl,
(v) halo which is fluoro, chloro, or bromo, with the proviso that not more than two such substituents are other than alkyl, or

(o) $—(CH_2)_pNR_{10}R_{11}$ wherein p is one, 2, or 3, and R_{10} and R_{11}, being the same or different, are individually,
(i) hydrogen,
(ii) C_1–C_8 alkyl,
(iii) C_5–C_{10} cycloalkyl,
(iv) C_7–C_{12} aralkyl, or
(v) phenyl optionally substituted by one, 2, or 3
(a) hydroxy,
(b) C_1–C_3 alkoxy,
(c) C_1–C_3 alkyl,
(d) trifluoromethyl,
(e) halo which is fluoro, chloro, or bromo, with the proviso that not more than two such substituents are other than alkyl, or

wherein R_{10} and R_{11} are taken together with the nitrogen to form a saturated or unsaturated heterocyclic amine ring consisting of from 2 to 7 carbon atoms, inclusive, and zero, one, or 2 additional hetero atoms or hetero atom groups, with the proviso that said heterocyclic amine ring contains 4 to 8 atoms in the ring, said additional hetero atoms or hetero atom groups being selected from the group consisting of oxygen, nitrogen, sulfur, —SO—, and $—SO_2—$ said heterocyclic amine ring being optionally substituted by one or 2 C_1–C_4 alkyl, C_2–C_8 alkylthiomethyl, or C_2–C_8 alkoxymethyl, C_1–C_4 hydroxyalkyl or phenyl;

wherein R_1 and R_2 are taken together and form a bivalent moiety which is:

(a) $—CH_2—(CH_2)_a—CH_2—$ wherein the integer "a" is zero to 5;

(b) $—CH_2—(CH_2)_b—X—(CH_2)_c—CH_2—$

wherein the integer "b" is zero and the integer "c" is zero, one, 2, or 3 or the integer "b" is one and the integer "c" is zero, one, or 2, and wherein x is oxa (—O—), thia (—S—), or $—N(R_{10})—$ wherein R_{10} is
(i) hydrogen,
(ii) C_1–C_8 alkyl,
(iii) C_5–C_{10} cycloalkyl,
(iv) C_7–C_{12} aralkyl, or
(v) phenyl optionally substituted by one, 2, or 3
(a) hydroxy,
(b) C_1–C_3 alkoxy,
(c) C_1–C_3 alkyl,
(d) trifluoromethyl,
(e) halo which is fluoro, chloro, or bromo, with the proviso that not more than two such substituents are other than alkyl;

wherein R_3 is hydrogen, or C_1–C_4 alkoxy and R_4 is hydrogen or C_1–C_4 alkoxy, with the proviso that one of R_3 and R_4 is hydrogen only when the other is other than hydrogen; and

wherein R_8 and R_9, being the same or different, are individually,
(i) hydrogen,
(ii) C_1–C_8 alkyl,
(iii) C_5–C_{10} cycloalkyl,
(iv) C_7–C_{12} aralkyl, or
(v) phenyl optionally substituted by one, 2, or 3
(a) hydroxy,
(b) C_1–C_3 alkoxy,
(c) C_1–C_3 alkyl,
(d) trifluoromethyl,
(e) halo which is fluoro, chloro, or bromo, with the proviso that not more than two such substituents are other than alkyl, or

wherein R_8 and R_9 are taken together with the nitrogen to form a saturated or unsaturated heterocyclic amine ring consisting of from 2 to 7 carbon atoms, inclusive, and zero, one, or 2 additional hetero atoms or hetero atom groups, with the proviso that said heterocyclic amine ring contains 4 to 8 atoms in the ring, said additional hetero atoms or hetero atom groups being selected from the group consisting of oxygen, nitrogen, sulfur, —SO—, and $—SO_2—$ said heterocyclic amine ring being optionally substituted by one or 2 C_1–C_4 alkyl, C_2–C_8 alkylthiomethyl, or C_2–C_8 alkoxymethyl, C_1–C_4 hydroxyalkyl or phenyl.

4,412,072
ISOCYANATE COMPOSITION

Yoshio Kamatani, and Noriaki Fujita, both of Osaka, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 3, 1981, Ser. No. 270,118
Claims priority, application Japan, Jun. 23, 1980, 55-85487
Int. Cl.³ C07D *273/04*
U.S. Cl. 544—68 **39 Claims**

1. A composition which comprises a stabilized reaction product of an organic isocyanate with carbon dioxide and at least one stabilizing additive selected from the group consisting of an organic peroxide, an inorganic peroxide, sulfur, a polysulfide compound having an S-S bond, a metal sulfide and a halogen; said stabilizing additive being admixed with the reaction product in an amount of 0.001 to 10% by weight based on the organic isocyanate at the time when the reaction product has obtained a predetermined conversion rate whereby the reaction product contains an isocyanate having a stabilized oxadiazinetrione ring structure.

4,412,073
ISOCYANURATE PREPARATION BY CATALYTIC, AMINOSILYL INITIATED CYCLOTRIMERIZATION OF ISOCYANATES

Jean Robin, Lyons, France, assignor to Rhone-Poulenc Specialites Chimiques, Courbevoie, France

Filed Feb. 1, 1982, Ser. No. 344,797
Claims priority, application France, Feb. 3, 1981, 81 02192; Dec. 9, 1981, 81 23135
Int. Cl.³ C07D *251/34*; C08G *18/02*; C08F *4/16*
U.S. Cl. 544—193 **20 Claims**

1. A process for the preparation of a monomeric or polymeric isocyanurate compound, comprising catalytically cyclotrimerizing an isocyanate in which the isocyanate moiety is not directly bonded to an aromatic carbon atom, in the presence of an effective amount of an aminosilyl catalysis initiator having the structural formula:

$$R_{(4-n)}Si—NR'R'']_n \qquad (I)$$

wherein R is a saturated or unsaturated, aliphatic, cycloaliphatic, aryl, aralkyl or alkylaryl monovalent hydrocarbon radical, or halo or cyano substituted such radical, and further wherein any two radicals R may together form a single divalent such hydrocarbon radical; R' is R, SiR_3 or an amido radical having the structural formula:

$$—CO—\underset{\displaystyle R}{\overset{\displaystyle |}{N}}—R'''$$

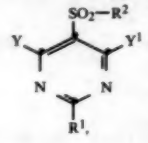
wherein R''' is R or SiR_3, with R being as above defined, and further wherein R', when R' is neither the amido radical nor SiR_3, may, together with the radical R'', form a single divalent such radical; R'' is R, or a hydrogen atom when R' is not the amido radical; and n is either 1 or 2, but when n is 2, R' is R.

4,412,074
2-ALKYL-5-ALKYL SULFONY 1-4,6-DIHALOPYRIMIDINES AND THE PRODUCTION THEREOF

Karl Hoegerle, Basel, and Kurt Ohnemus, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Dec. 10, 1981, Ser. No. 329,169
Claims priority, application Switzerland, Dec. 17, 1980, 9301/80
Int. Cl.³ C07D 239/40
U.S. Cl. 544—298 5 Claims

1. A compound of the formula I



(I)

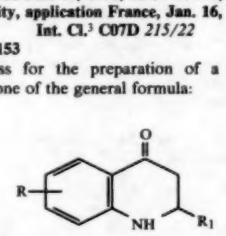
wherein each of R^1 and R^2 independently is straight chain or branched chain C_1–C_5alkyl, and each of Y and Y^1 independently is chlorine, fluorine or bromine.

4,412,075
PROCESS FOR THE PREPARATION OF QUINOLIN-4-ONES

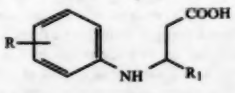
Michel Baudouin, St-Fons, and Michel Desbois, Rillieux la Pape, both of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

Filed Jan. 15, 1982, Ser. No. 339,725
Claims priority, application France, Jan. 16, 1981, 81 00762
Int. Cl.³ C07D 215/22
U.S. Cl. 546—153 10 Claims

1. A process for the preparation of a 1,2,3,4-tetrahydroquinolin-4-one of the general formula:



(wherein R represents a hydrogen atom or a substituent selected from halogen atoms, straight- or branched-chain alkyl radicals containing 1 to 4 carbon atoms, straight- or branched-chain alkoxy radicals containing 1 to 4 carbon atoms, and the trifluoromethyl radical, and R_1 represents a hydrogen atom, a straight- or branched-chain alkyl radical containing 1 to 4 carbon atoms or the trifluoromethyl radical) which comprises cyclizing a 3-anilinopropionic acid of the general formula:



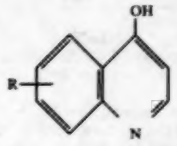
(wherein R and R_1 are as hereinbefore defined) in a mixture of hydrofluoric acid and boron trifluoride, and isolating the quinolinone product obtained.

4,412,076
PREPARATION OF 4-HYDROXYQUINOLINES

Michel Baudouin, St. Fons, and Daniel Michelet, Tassin, both of France, assignors to Rhone-Poulenc Sante, Courbevoi, France

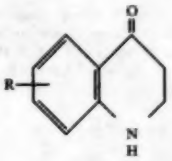
Filed Jan. 15, 1982, Ser. No. 339,723
Claims priority, application France, Jan. 16, 1981, 81 00764
Int. Cl.³ C07D 215/22
U.S. Cl. 546—153 9 Claims

1. A process for the preparation of a 4-hydroxyquinoline of the general formula:



(I)

in which R represents a hydrogen atom, or one, two or three substituents, which may be the same or different, selected from halogen atoms, alkyl radicals containing 1 to 4 carbon atoms, alkoxy radicals containing 1 to 4 carbon atoms, and the trifluoromethyl radical, the substituent(s) being in the 2-, 3-, 5-, 6-, 7- or 8-position, which comprises oxidising a 1,2,3,4-tetrahydroquinolin-4-one of the general formula:



(II)

in which R is as hereinbefore defined, by means of oxygen or air, in the presence of a catalyst based on platinum or ruthenium, or alloys thereof, on a support.

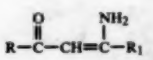
5. A process for the preparation of a 4-hydroxyquinoline of general formula (I) depicted in claim 1 in which R represents a halogen atom, which comprises carrying out the catalytic dehydrogenation of a 1,2,3,4-tetrahydroquinolin-4-one of general formula (II) in which R represents a halogen atom in the presence of a catalyst based on ruthenium or platinum, or alloys thereof, on a support, the reaction being carried out in an organic solvent such as trichlorobenzene, or in water acidified beforehand by an inorganic acid.

4,412,077
PROCESS FOR PREPARING 5-(LOWER-ALKANOYL)-6-(LOWER-ALKYL)-2(1H)-PYRIDINONE

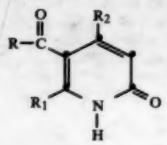
George Y. Lesher, Shodack, and Baldev Singh, East Greenbush, both of N.Y., assignors to Sterling Drug Inc., New York, N.Y.

Filed Mar. 15, 1982, Ser. No. 357,872
Int. Cl.³ C07D 213/50
U.S. Cl. 546—298 7 Claims

1. The process which comprises heating at about 100° C. to 150° C. 2-(lower-alkanoyl)-1-(lower-alkyl)ethenamine of the formula



where R and R_1 are each lower-alkyl, with lower-alkyl 2-propynoate or 2-butynoate to produce 4-R_2-5-(lower-alkanoyl)-6-(lower-alkyl)-2(1H)-pyridinone having the formula



where R_2 is hydrogen or methyl respectively.

4,412,078

HYDANTOINYLSILANES

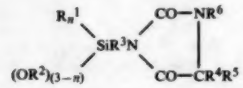
Abe Berger, Summit, N.J., assignor to M & T Chemicals Inc., Woodbridge, N.J.

Continuation of Ser. No. 97,902, Nov. 28, 1979, abandoned. This application Dec. 1, 1981, Ser. No. 326,318

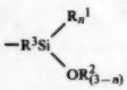
Int. Cl.³ C07F *7/18, 7/10*

U.S. Cl. 548—110 **12 Claims**

1. A hydantoinyl silane represented by the generic formula



wherein R^1 is selected from the group consisting of alkyl, aryl, cyanoalkyl, trifluoropropyl, alkenyl, alkynyl and halophenyl; R^2 is selected from the group consisting of alkyl, alkaryl and cycloalkyl; R^3 is alkylene; R^4 and R^5 are individually selected from the group consisting of hydrogen, alkyl, phenyl and alkaryl; R^6 is



or is selected from the same group as R^4 and n is 0, 1, 2 or 3 with the proviso that any alkyl or alkylene group contains from 1 to 12 carbon atoms and any alkenyl or alkynyl group contains from 2 to 12 carbon atoms.

4,412,079

THIADIAZOLE COMPOUNDS AND METHODS OF USING SAID COMPOUNDS IN AGRICULTURE

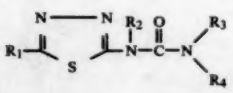
Tony Cebalo, Indianapolis, Ind., and Robert A. Walde, Berwyn, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Division of Ser. No. 229,167, Feb. 24, 1972, which is a continuation-in-part of Ser. No. 37,836, May 15, 1970, abandoned, which is a continuation-in-part of Ser. No. 856,461, Sep. 9, 1969, abandoned, which is a continuation-in-part of Ser. No. 762,604, Sep. 25, 1968, abandoned, which is a continuation-in-part of Ser. No. 712,585, Mar. 13, 1968, abandoned. This application Sep. 20, 1982, Ser. No. 419,883

Int. Cl.³ A01N *47/36*; C07D *285/12*

U.S. Cl. 548—141 **5 Claims**

1. A compound having the formula



wherein

R_1 is a C_3-C_7 alkyl radical,

R_2 is a C_1-C_4 alkyl radical,

R_3 is a C_1-C_4 alkyl radical or a C_2-C_4 alkenyl radical, and

R_4 is hydrogen or a C_1-C_4 alkyl radical or a C_2-C_4 alkenyl radical.

4,412,080

METHODS FOR PREPARING CYCLOPOLYSILOXANES

Robert E. Williams, Jr., Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 16, 1982, Ser. No. 408,103

Int. Cl.³ C07F *7/08*

U.S. Cl. 556—460 **8 Claims**

1. A process for preparing cyclic dimethylsiloxanes of the formula:

$$[(CH_3)_2SiO]_m$$

where m predominantly equals a whole number from 3–6, which comprises hydrolyzing dimethyldichlorosilane with a normal C_{6-16} alkylsulfonic acid with aqueous HCl containing, by weight, from 20% to saturated aqueous HCl depending on the temperature.

4,412,081

METHODS FOR PREPARING DECAMETHYL CYCLOPENTASILOXANE

Robert E. Williams, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 27, 1982, Ser. No. 412,062

Int. Cl.³ C07F *7/08*

U.S. Cl. 556—460 **5 Claims**

1. A process for preparing a cyclic pentamer siloxane of the general formula

$$[(CH_3)_2SiO]_5$$

from octamethyl cyclotetrasiloxane by heating the latter with a normal C_{6-16} alkyl sulfonic acid having the formula

$$n\text{-}C_xH_{(2x+1)}SO_3H$$

where x=6 to 16, inclusive, in the presence of aqueous HCl at a temperature in excess of 50° C.

4,412,082

METHOD FOR PREPARING 4-HYDROXYPHENYLACETIC ACID

Motoo Mutsukado, and Shin Yamada, both of Funabashi, Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

Filed Mar. 2, 1982, Ser. No. 353,948

Claims priority, application Japan, Mar. 13, 1981, 56-36327

Int. Cl.³ C07C *65/01*

U.S. Cl. 562—478 **13 Claims**

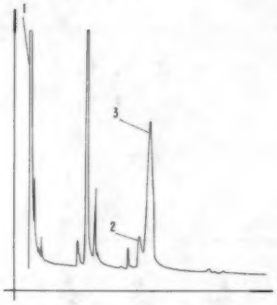
1. A method for preparing 4-hydroxyphenylacetic acid comprising the steps of first reacting benzyl phenyl ether with formaldehyde and hydrogen chloride to form 4-benzyloxybenzyl chloride, second reacting the resultant 4-benzyloxybenzyl chloride with an alkali metal cyanide in at least one solvent selected from the group consisting of water and an organic solvent to form 4-benzyloxyphenylacetonitrile, and hydrolyzing the resultant 4-benzyloxyphenylacetonitrile in the presence of an acid catalyst.

4,412,083

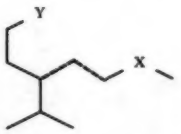
PROCESS FOR PRODUCING SOLANONE, NORSOLANADIONE AND INTERMEDIATES THEREFOR

Kenneth K. Light, North Ogden, Utah; William L. Schreiber, Jackson, N.J.; Joseph A. McGhie, Montclair, N.J.; Ronald P. Schreck, Old Bridge, N.J.; Takao Yoshida, West Long Branch, N.J.; Loren B. Schreiber, Aberdeen, N.J., and Ranya Muralidhara, Fair Haven, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Mar. 11, 1982, Ser. No. 357,158
Int. Cl.³ C07C *119/12*
U.S. Cl. 564—279 3 Claims

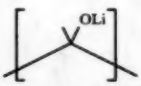


1. At least one compound defined according to the structure:

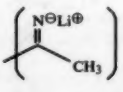


wherein one of the dashed lines is a carbon-carbon double bond and the other of the dashed lines is a carbon-carbon single bond; wherein X represents:

(ii)



wherein R represents hydrogen or methyl; and wherein Y represents



4,412,084

PROCESS FOR PRODUCING ETHYLENE GLYCOL

John Kollar, 6 Spencer Ct., Wyckoff, N.J. 07481

Continuation-in-part of Ser. No. 286,721, Jul. 28, 1981, abandoned, which is a continuation-in-part of Ser. No. 183,537, Sep. 2, 1980, Pat. No. 4,337,371. This application Feb. 26, 1982, Ser. No. 352,919
Int. Cl.³ C07C *31/20, 29/00*
U.S. Cl. 568—852 14 Claims

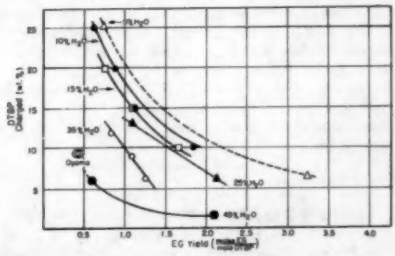
1. In a process for producing ethylene glycol by reacting methanol, formaldehyde and an organic peroxide having the formula R-O-O-R¹, wherein each R and R¹ is an alkyl or aralkyl group containing from 3 to 12 carbon atoms in a liquid reaction medium, the improvement comprising reacting portions of the total amount of the formaldehyde and peroxide with the methanol in the presence of a basic material present in the reaction medium in an amount sufficient to reduce the hydrogen ions that are formed in the reaction without unduly reducing the ethylene glycol production due to by-product formation, by incrementally adding each of said portions to the reaction medium containing methanol to permit a fraction of the final conversion of said formaldehyde and peroxide to take place prior to the addition of the next added portion, said next added portion being added to said reaction medium wherein said fraction of the final conversion has taken place and containing a concentration of ethylene glycol greater than that of the reaction medium to which said previous portions were added, and continuing the incremental additions until all of said peroxide and formaldehyde has been added to said reaction medium and subjected to reaction to produce the desired amount of ethylene glycol.

4,412,085

PROCESS FOR PRODUCING ETHYLENE GLYCOL

John Kollar, 6 Spencer Ct., Wyckoff, N.J. 07481

Continuation-in-part of Ser. No. 183,537, Sep. 2, 1980, Pat. No. 4,337,371, and a continuation-in-part of Ser. No. 286,721, Jul. 28, 1981, abandoned. This application Feb. 26, 1982, Ser. No. 352,920
Int. Cl.³ C07C *31/20, 29/00*
U.S. Cl. 568—852 9 Claims



1. In a process for producing ethylene glycol by reacting methanol, an organic peroxide, and formaldehyde in the presene of water, said organic peroxide having the formula R—O—O—R¹ wherein R and R¹ each is an alkyl or aralkyl group containing 3 to 12 carbon atoms, the improvement comprising utilizing organic peroxide and water in the following ranges:

Peroxide	Water
greater than 6 to about 12 weight percent	about 0.5 to about 35 weight percent
greater than about 12 to about 15 weight percent	about 0.5 to about 25 weight percent
greater than about 15 to about 20 weight percent	about 0.5 to about 15 weight percent

-continued

Peroxide	Water
greater than about 20 to about 25 weight percent	about 0.5 to about 10 weight percent

the above amounts based on the total weight of methanol, organic peroxide, formaldehyde and water present in the initial reaction mixture, the amount of formaldehyde present being from about 0.5 to about 13 weight percent.

4,412,086

PROCESS FOR SEPARATING FERRIC IRON FROM CHLORINATED HYDROCARBONS

William Q. Beard, Jr., and Richard L. Wilson, both of Wichita, Kans., assignors to Vulcan Materials Company, Birmingham, Ala.

Continuation-in-part of Ser. No. 122,040, Feb. 19, 1980, Pat. No. 4,307,261. This application Jun. 1, 1981, Ser. No. 269,514
The portion of the term of this patent subsequent to Dec. 22, 1998, has been disclaimed.
Int. Cl.³ C07C *17/38*
U.S. Cl. 570—262 **17 Claims**

1. A process for the removal of ferric chloride from chlorinated aliphatic hydrocarbons having less than 6 carbon atoms per molecule, comprising the steps of:

(a) mixing a liquid comprising a major amount of at least one relatively volatile saturated aliphatic chlorinated hydrocarbon having 2 to 5 carbon atoms per molecule and at least 0.01% of ferric chloride admixed therewith, with at least 10 volumes (per 100 volumes of volatile chlorinated hydrocarbon) of a relatively less volatile oil composition comprising a hydrocarbon having at least 6 concatenated aliphatic carbon atoms per molecule and selected from the group consisting of alkanes, cycloalkanes, alkenes, cycloalkenes, alkyl aromatic hydrocarbons, and mixtures of at least two of the foregoing;

(b) heating the resulting mixture at a temperature between about 60° and about 140° C. until a major portion of said ferric chloride is reduced to the divalent state and an easily filtrable, essentially inert, non-hazardous, powdery solid precipitate consisting largely of ferrous chloride combined with a small amount of carbonaceous material is formed without significant decomposition of said chlorinated hydrocarbon;

(c) separating said chlorinated hydrocarbon as a vapor from said oil composition and from said precipitate; and

(d) mechanically separating said oil composition from said precipitate.

4,412,087

VISCOSITY INDEX IMPROVER WITH HIGH THICKENING POWER

William J. Trepka, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 16, 1981, Ser. No. 331,421
Int. Cl.³ C10M *1/18*
U.S. Cl. 585—12 **22 Claims**

1. Shear-stable, mineral oil-based compositions comprising a major amount of a mineral base oil, and a minor effective viscosity improving amount of an oil-soluble hydrogenated conjugated diene/monovinylarene random block copolymer dissolved therein, said copolymer characterized by:

polymerized conjugated diene content: 44–70 weight percent

total copolymerized monovinylarene content: 56–30 weight percent

block monovinylarene content: 9–23 weight percent

molecular weight M_n: 94,000–199,000

vinyl, before hydrogenation, based on conjugated diene: 30–51 weight percent

vinyl, before hydrogenation, based on entire copolymer: 13–33 weight percent

weight percent vinyl, based on copolymer, plus weight percent monovinylarene: 60–72.

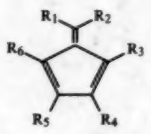
4,412,088

CYCLOPENTADIENE DERIVATIVES, METHOD FOR PREPARING, AND USE THEREOF

Bruce A. Gruber, Worthington; Diether Koch, Dublin; Heimo J. Langer, Columbus, and William R. Dunnavant, Columbus, all of Ohio, assignors to Ashland Oil, Inc., Ashland, Ky.

Filed Sep. 10, 1981, Ser. No. 300,786
Int. Cl.³ C07C *13/00, 1/20*
U.S. Cl. 585—23 **26 Claims**

1. Disubstituted cyclopentadiene derivative of the formula:



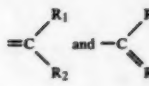
wherein each R_1 and R_2 individually is an alkyl containing 1 to 10 carbon atoms, or a hydrocarbon containing one or more oxygen bridges in the chain and containing up to 10 carbon atoms, or a furyl group; or are interconnected and together with the carbon atom to which they are connected form a cycloaliphatic hydrocarbon group or one of R_1 or R_2 is hydrogen; and wherein each R_3, R_4, R_5 and R_6 individually is hydrogen or methyl or

or R_4 or R_5 is

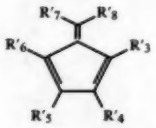
and provided that a maximum of only one such R_3, R_4, R_5 and R_6 is methyl and provided that one such R_3, R_4, R_5 and R_6 is

wherein each R_7 and R_8 individually is a hydrocarbon group containing 1–10 carbon atoms or a hydrocarbon containing one or more oxygen bridges in the chain and containing up to 10 carbon atoms or are interconnected and together with the carbon atom to which they are connected form a cycloaliphatic hydrocarbon group; or one of R_7 or R_8 is hydrogen, and further provided that at least one of R_7 and R_8 differs from R_1 and R_2 when both R_1 and R_2 are methyl; or isomers, or prepolymers thereof.

17. A method for preparing disubstituted cyclopentadiene derivative having two exocyclic groups of the formula

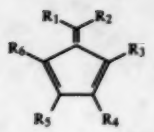


which comprises reacting at a temperature of about 40°–90° C., a fulvene having the formula:



wherein each R'_7 and R'_8 individually is a hydrocarbon containing 1 to 10 carbon atoms or a hydrocarbon containing one or more oxygen bridges in the chain and contains up to 10 carbon atoms; or are interconnected and together with the carbon atom to which they are connected form a cycloaliphatic hydrocarbon group or one of R'_7 or R'_8 is hydrogen; and wherein each R'_3, R'_4, R'_5, and R'_6 individually is hydrogen or methyl or R'_4 or R'_5 can have the structure

provided that only one such R'_3, R'_4, R'_5, and R'_6 is methyl; with an aldehyde or ketone in the presence of a basic catalyst in an amount of about 20 to about 50 mole percent based upon the moles of said fulvene for a time sufficient to provide a derivative of the formula:



or isomers thereof, or mixtures thereof; wherein each R_1 and R_2 individually is a hydrocarbon containing 1 to 10 carbon atoms or a hydrocarbon containing one or more oxygen bridges in the chain and containing up to 10 carbon atoms; or are interconnected and together with the carbon atom to which they are connected form a cycloaliphatic hydrocarbon group or furyl or one of R_1 or R_2 is hydrogen, and wherein each R_3, R_4, or R_5 or R_6 is hydrogen or methyl or

provided that one such R_3, R_4, R_5, or R_6 is

provided that only one such R_3, R_4, R_5, or R_6 is methyl and wherein R_7 and R_8 are the same as R'_7 and R'_8 respectively and wherein about stoichiometric amounts of said fulvene and aldehyde or ketone are employed, except when R_1, R_2, R_7, and R_8 are methyl the amount of aldehyde or ketone employed is at least twice the stoichiometric amount needed.

4,412,089

PROCESS FOR THE PREPARATION OF DIENES AND/OR TRIENES

Nicolaas Mulder; Willem Terlouw, and Jan H. Wevers, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Jul. 16, 1982, Ser. No. 399,040

Claims priority, application United Kingdom, Aug. 24, 1981, 8125781

Int. Cl.³ C07C 6/00

U.S. Cl. 585—645 **7 Claims**

1. Process for the preparation of at least one of 2,6-dimethyl-1,5-heptadiene and 2,6,10-trimethyl-1,5,9-undecatriene by reacting at a temperature in the range from 50° to 100° C. and a pressure up to 50 bar polyisoprene having a molecular weight in the range from about 5,000 to about 1,000,000 with isobutene in the presence of a heterogeneous diaproportionation catalyst.

4,412,090

THERMAL SENSOR FOR DETECTING TEMPERATURE DISTRIBUTION

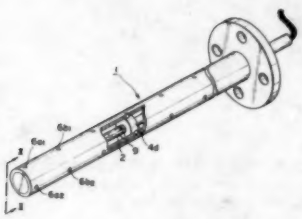
Yoshio Kawate, Toyonaka; Nobuyuki Nagai, Kobe; Takefumi Horiuchi, Kobe; Teruhisa Uehara, Kobe, and Susumu Hachiya, Miki, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Nov. 5, 1981, Ser. No. 318,401

Claims priority, application Japan, Nov. 7, 1980, 55-159782[U]

Int. Cl.³ H01L *35/02*

U.S. Cl. 136—230 4 Claims



1. A thermal sensor comprising:

(a) an outer protective casing extending along a linear axis;

(b) a plurality of juxtaposed temperature sensing devices disposed within said outer protective casing and extending along the linear axis thereof, said plurality of juxtaposed temperature sensing devices having their respective temperature sensing areas located at spaced intervals;

(c) a plurality of annular disc-like fins disposed within said outer protective casing and extending from said plurality of juxtaposed temperature sensing devices to said outer protective casing, each of said plurality of annular disc-like fins being in good thermal contact both with one of said temperature sensing areas of said plurality of juxtaposed temperature sensing devices and with said outer protective casing; and

(d) insulating filler material disposed within said outer protective casing in between said annular disc-like fins to ensure the endurance of said temperature sensing devices and to deter heat transfer along the linear axis of the thermal sensor, thereby enhancing the accuracy of the temperature measurement.

4,412,091

POLYCRYSTALLINE PHOTOVOLTAIC CELL

John F. Jordan, and Curtis M. Lampkin, both of El Paso, Tex., assignors to Photon Power, Inc., El Paso, Tex.

Division of Ser. No. 25,840, Apr. 2, 1979, Pat. No. 4,304,607, which is a division of Ser. No. 892,375, Mar. 31, 1978, Pat. No. 4,159,914, which is a continuation-in-part of Ser. No. 631,815, Nov. 14, 1975, Pat. No. 4,086,101, which is a continuation-in-part of Ser. No. 508,570, Sep. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 431,705, Jan. 8, 1974, Pat. No. 3,880,633. This application Mar. 4, 1980, Ser. No. 127,149

Int. Cl.³ H01L *31/06*

U.S. Cl. 136—258 6 Claims

1. An improved cadmium sulfide photovoltaic cell comprising a cadmium sulfide bilayer, the bilayer comprising an initial layer of cadmium sulfide microcrystals having an average crystal diameter of from about 0.02 microns to about 0.1 microns and a second cadmium sulfide layer comprising cadmium sulfide crystals having an average crystal diameter of from about 0.1 microns to about 0.5 microns, wherein said cadmium sulfide bilayer comprises a dopant and said second cadmium sulfide layer being in interfacial contact with a barrier layer.

4,412,092

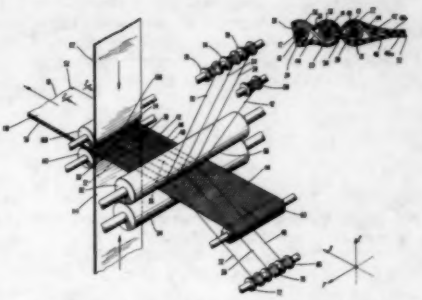
MULTICONDUCTOR COAXIAL CABLE ASSEMBLY AND METHOD OF FABRICATION

George A. Hansell, III, Newark, Del., assignor to W. L. Gore & Associates, Inc., Newark, Del.

Filed Aug. 24, 1981, Ser. No. 295,822

Int. Cl.³ H01B *11/20, 13/22*

U.S. Cl. 174—36 20 Claims



1. A flat multiconductor cable assembly of unlimited length comprising:

a plurality of signal conductors positioned in longitudinally parallel and transversely co-planar relation, said signal conductors being electrically insulated from one another and arranged in clusters of one or more, each of said clusters being individually and coaxially surrounding by an electrically conductive shield, the individually shielded clusters being transversely spaced from one another; and

means for grounding the shields of said clusters, including

a ground conductor, and

a transverse conductive element for electrically interconnecting the shields of said shielded clusters with said ground conductor in the transverse direction, said transverse conductive element being interwoven among the transversely spaced clusters and extending intermittently in the longitudinal direction in the spaces between said clusters, whereby said individually shielded clusters are arbitrarily geometrically arranged on said transverse conductive element.

15. Method for fabricating a flat multiconductor cable assembly of unlimited length having at least one ground wire conductor wherein a plurality of insulated signal conductors are positioned in longitudinally parallel and transversely coplanar relation with the ground wire conductor, and wherein the signal conductors are arranged in clusters of one or more, and the individual clusters are coaxially surrounded by an electrically conductive shield, the shielded clusters being physically spaced from, but electrically interconnected with, one another and the ground wire conductor in the transverse direction, the method comprising:

(a) dividing sources of the unlimited length individually shielded clusters into two groups positioned proximate a pair of pinch rollers;

(b) continuously feeding the shielded clusters into the bite of the pinch rollers, the shielded clusters from one of said groups being interspersed with the shielded clusters from the other of said two groups across the transverse width of the bite, and the shielded clusters from one group being fed from one side of a plane passing through the bite of the pinch rollers and the shielded clusters from the other group being fed from the other side of the plane;

(c) concurrently feeding at least one continuous uninsulated grund wire conductor of unlimited length into the bite of the pinch rollers parallel with, and transversely spaced from, said clusters; and

(d) concurrently feeding an uninsulated transverse conductive element of unlimited longitudinal length into the bite

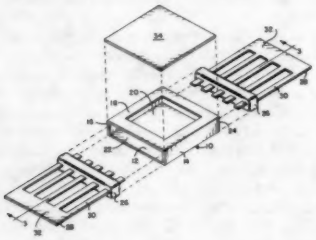
of the rollers along said plane and between the shielded clusters being fed from the two source groups, the transverse conductive element transversely spanning and electrically interconnecting the shields of the clusters and the uninsulated ground wire conductor, the transverse conductor having sufficient flexibility in the transverse direction to conform to a serpentine transverse conductor element path shape wherein the transverse conductive element passes alternately to one side, between, and to the other side of the interspersed clusters with respect to said plane, said transverse conductor extending intermittently in the spaces between interspersed clusters along the entire longitudinal length of the cable assembly.

4,412,093

MICROCIRCUIT FLAT PACK WITH INTEGRAL SHELL

Nicolaas Wildeboer, South Dartmouth, Mass., assignor to Isotronics, Inc., New Bedford, Mass.

Filed Sep. 16, 1981, Ser. No. 302,524
Int. Cl.³ H05K *5/06*
U.S. Cl. 174—52 FP **7 Claims**



1. Apparatus for forming a microcircuit flat package comprising:

an integral and elongated metal tubular shell subassembly having four walls closed on themselves to define two open ends, said walls consisting of first and second broad walls which are joined by respective third and fourth side walls to form said open ends, one of said broad walls having an opening formed therein to provide a continuous and surrounding surface which is peripheral to said opening formed in said broad wall;

an elongated integral insulator subassembly having an array of electrical leads extending through and sealed within an insulative glass body, the insulative glass body of the integral insulator subassembly being dimensioned to be received in each said open end of said tubular shell and to align the leads in substantially parallel alignment with the longitudinal axis of said tubular shell, with the peripheral surface of the insulative body in glass-to-metal non-sealing engagement with the surrounding surfaces of said first, second, third, and fourth walls of said integral shell, with each of the leads terminating at an inner end within said tubular shell and with each of the leads terminating at an outer end exteriorly of said tubular shell, said peripheral surface of the insulative body in glass-to-metal non-sealing engagement with the surrounding surfaces of said first, second, third, and fourth walls of said integral shell providing opposed, touching surfaces that can be subsequently sealed together;

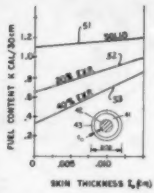
said continuous peripheral surface surrounding said opening in said one of said broad walls of said tubular shell providing a sealing surface to which a cover can be hermetically sealed.

4,412,094

COMPOSITELY INSULATED CONDUCTOR RISER CABLE

Timothy S. Dougherty, Roswell; John J. Kissell, Dunwoody, both of Ga., and Glenn L. Schmehl, Kingsville, Md., assignors to Western Electric Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 151,854, May 21, 1980, abandoned. This application Jul. 28, 1981, Ser. No. 287,620
Int. Cl.³ H01B *7/34*
U.S. Cl. 174—110 F **8 Claims**



1. A fire-retardant cable which is particularly suited for use within a building and which has a predetermined mutual capacitance, said cable comprising:

a core which comprises:

a plurality of conductors, each of said conductors being insulated with a composite expanded insulation which comprises:

an inner layer of a cellular polyolefin plastic material which has an expansion that does not exceed a predetermined percent; and

an outer layer of a relatively fire-retardant plastic material, said outer layer being such that the ratio of its weight to the weight of said composite expanded insulation per unit length of conductor is at least equal to that of a cable having the predetermined mutual capacitance and comprising a plurality of said conductors each of which is covered with a composite unexpanded insulation comprising an unexpanded inner layer of said polyolefin plastic material and an outer layer of said relatively fire-retardant plastic material to cause said composite expanded insulation to have a limiting oxygen index which is at least equal to that of the composite unexpanded insulation and;

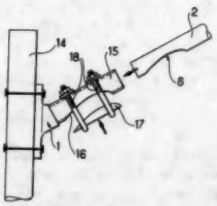
a fire-retardant sheath which encloses said core.

4,412,095

ELECTRIC INSULATOR OF THE LINE POST TYPE

Denis Thuillier, Vichy, and Michel Willem, Abrest, both of France, assignors to Societe Anonyme dite: CERAVER, Paris, France

Filed Feb. 9, 1982, Ser. No. 347,198
Claims priority, application France, Feb. 13, 1981, 81 02888
Int. Cl.³ H01B *17/16*
U.S. Cl. 174—158 R **6 Claims**



1. An electric insulator of the line post type which has a rod made of resin and glass fibres covered with an insulating sheath, one end of the rod being made fast with a fitting intended to be fixed on a post, in which rod the wall of said one

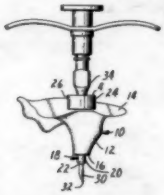
end has at least one hollow orthogonal to the direction of the fibres and situated in the zone where the fibres are liable to be subject to high compression stress, the depth of the hollow not reaching the neutral fibres of the rod, the end of the rod having said hollow being held motionless in a cylindrical socket of said fitting which socket is open adjacent said hollow and accommodates a complementary locking piece which fills said hollow.

4,412,096

COMBINATION EARMOLD AND RECEIVER ADAPTER

Bradly J. Edgerton, Pico Rivera; William F. House, Whittier, and Robert C. Michaels, Santa Barbara, all of Calif., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 24, 1980, Ser. No. 219,896
Int. Cl.³ H04R *25/02*
U.S. Cl. 381—60 **11 Claims**



1. A combination earmold and receiver adapter for insertion in the external auditory canal of the ear and for use in fitting and evaluating hearing aids comprising:

an earmold comprising a flexible, elastic, fast-setting silicone material having a density after curing of about 0.5 to 3.0 gm/cc, said earmold conforming substantially to the contours of said external auditory canal of said ear; and capable of providing an accoustical seal when inserted in said external auditory canal;

a hearing aid receiver adapter inserted through said earmold, said receiver adapter comprising a semi-rigid longitudinal conduit, said longitudinal conduit capable of providing a straight passageway for sound energy from an external receiver to the occluded space of said external auditory canal of said ear when said earmold is inserted in said external auditory canal, and a receiver mounting flange, at one end of said longitudinal conduit, capable of allowing easy change of receivers during a hearing evaluation process.

4,412,097

VARIABLE-DIRECTIVITY MICROPHONE DEVICE

Yukinobu Ishigaki, Machida; Kaoru Totsuka, Tokyo; Makoto Yamamoto, Yokosuka, and Naotaka Miyaji, Yamato, all of Japan, assignors to Victor Company of Japan, Ltd., Yokohama, Japan

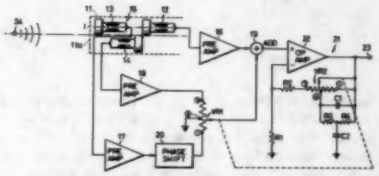
Filed Jan. 21, 1981, Ser. No. 227,035
Claims priority, application Japan, Jan. 28, 1980, 55-8681[U]; Jan. 28, 1980, 55-8682[U]
Int. Cl.³ H01R *1/10*
U.S. Cl. 381—92 **2 Claims**

1. A variable directivity microphone device comprising:

a microphone unit assembly provided and arranged with at least three microphone units, said three microphone units being mutually separated by predetermined distances, and front faces of first and second microphone units among said three microphone units being provided and arranged facing the front surface of said microphone unit assembly while the front face of a third microphone unit is provided and arranged in a direction opposite to those of said first and second microphone units;

a first and second variable resistors respectively having a first terminal at one end, a second intermediate terminal, and a third terminal at the other end, wherein respective sliders are mutually linked or ganged and movable between first, second, and third positions corresponding to said first through third terminals, said first variable resistor having its first and third terminals respectively coupled to outputs of said second and third microphone units and its second intermediate terminal coupled to ground;

a phase-shifter coupled between the output of said second microphone unit and said first terminal of said first variable resistor, for substantially only performing a phase shift in a high-frequency range, said phase-shifter having a phase shifting characteristic wherein the output phase approaches −180 degrees from −90 degrees as a ratio ω/ω_a becomes larger than unity and approaches zero degrees from −90 degrees as the ratio ω/ω_a becomes smaller than unity, where ω is the angular frequency and ω_a is the angular frequency at a point lagging in phase by 90 degrees;



an adder for adding and mixing the output of said first microphone unit and a signal obtained from the slider of said first variable resistor; and

a frequency characteristic compensating circuit having an operational amplifier and a frequency characteristic circuit, for compensating for the frequency characteristic of an output signal of said adder, said second variable resistor having its first terminal and slider coupled to an output of said operational amplifier and its third terminal coupled to one input of said operational amplifier, said frequency characteristic circuit being connected in parallel with said second variable resistor between said first and second terminals of said second variable resistor,

said microphone device having its directivity varied from non-directivity, to primary unidirectivity, and then to secondary unidirectivity, as the sliders of said first and second variable resistors vary from said third, to second, and then to first positions so that the output phase at said phase-shifter approaches zero degree from −90 degrees and then approaches −180 degrees from −90 degrees.

4,412,098

AUDIO SIGNAL RECOGNITION COMPUTER

Byung H. An, Anaheim, Calif., assignor to Interstate Electronics Corporation, Anaheim, Calif.

Division of Ser. No. 73,792, Sep. 10, 1979, Pat. No. 4,292,470.
This application Mar. 30, 1981, Ser. No. 249,296
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—43 **3 Claims**

1. Apparatus for identifying signal patterns by comparing plural data elements identifying such patterns with plural data elements identifying a stored reference pattern, comprising:

a first buffer storing said plural data elements identifying signal patterns;

a second buffer storing said plural data elements identifying a reference pattern;

a first register for storing locations in said first buffer at which said plural data elements identifying signal patterns begin;

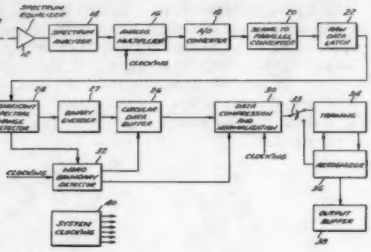
a second register for storing locations in said first buffer at which said plural data elements identifying signal patterns end;

first addressing means for writing plural data elements iden-

tifying said signal pattens into said first buffer, in sequential order, as said plural data elements are received;

means for determining whether said first buffer contains the plural data elements for a complete signal pattern;

second addressing means responsive to said determining means for reading plural data elements identifying said signal patterns from said first buffer at a time when the plural data elements for a complete signal pattern are stored in said first buffer, said second addressing means



operating in response to the locations stored in said first and second registers, said reading performed on a time shared basis time independently from said writing operation performed by said first addressing means such that the new writing operations do not have to be delayed until previously written data is read and compared with said reference patterns; and

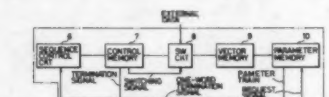
means for comparing said plural data elements read by said second addressing means with data elements stored in said second buffer.

4,412,099

SOUND SYNTHESIZING APPARATUS

Katsuyuki Niyada; Taisuke Watanabe, both of Sagamihara; Shoji Hiraoka, Dobashi, and Shuji Morii, Tokyo, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 15, 1981, Ser. No. 264,175
Claims priority, application Japan, May 16, 1980, 55-65545
Int. Cl.³ G10L *1/00*
U.S. Cl. 381—51 **6 Claims**



2. A sound synthesizing apparatus comprising a sound synthesizing circuit, which converts sound data into sound signals, and a control circuit, said control circuit comprising:

(a) a first memory in which information indicative of the order of words to be pronounced and intervals between said words as well as switching information are prestored, said first memory being arranged to send a piece of address information one after another in response to a timing signal fed thereto;

(b) a variable data producing circuit for producing data which varies as a function of time;

(c) a switching circuit controlled by said switching information for selecting said information indicative of the order of words from said first memory or the variable data;

(d) a second memory in which pieces of information indicative of first addresses of sound data are prestored, one of said pieces of information being selected in accordance with said information or variable data from said switching circuit; and

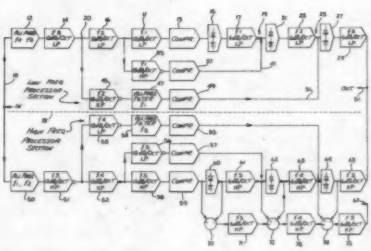
(e) a third memory in which said sound data is prestored as parameters, said sound data being read out in accordance with said information from said second memory one after another in synchroniusm with an external synchronous signal, the read out parameter train being fed to said sound synthesizing circuit to be converted into sound signals.

4,412,100

MULTIBAND SIGNAL PROCESSOR

Robert A. Orban, Belmont, Calif., assignor to Orban Associates, Inc., San Francisco, Calif.

Filed Sep. 21, 1981, Ser. No. 303,789
Int. Cl.³ H04B *1/66;* H04M *1/00*
U.S. Cl. 381—100 **36 Claims**



1. A multiband processor for processing an input signal comprising:

a first and a second lowpass filter, each having approximately a first cutoff frequency;

a first signal processing means for processing a signal, coupled between said first and second filters to receive the output of said first filter;

a third highpass filter having a cutoff frequency approximately equal to said first frequency coupled to said first filter;

a second signal processing means for processing a signal coupled to said third filter;

first combining means for combining the outputs of said second filter and said second signal processing means;

a fourth and a fifth lowpass filter each having approximately a second cutoff frequency different than said first frequency, said fourth and fifth filters being coupled in series with said first and second filters, said fourth filter being coupled to the inputs of said first and third filters, the output of said first combining means being coupled to the input of said fifth filter, and said fourth filter being coupled to receive said input signal;

a sixth highpass filter having a cutoff frequency approximately equal to said second frequency, coupled to said fourth filter;

a seventh allpass filter having phase response approximately matching the phase response of the summation of said first, second, and third filters coupled to said sixth filter; and

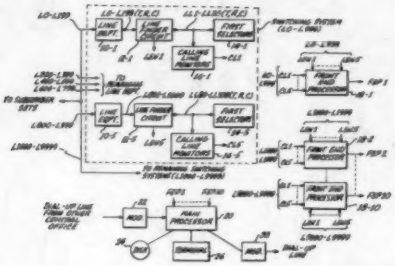
second combining means for combining the signal from said sixth and seventh filters with the output signal from said fifth filter;

whereby efficient multiband signal processing is achieved at the output of said second combining means.

4,412,101
CALL DATA MONITORING FOR ELECTROMECHANICAL TELEPHONE SWITCHING SYSTEMS

Wallace G. Brown, Redmond, and Otha C. Lee, Kirkland, both of Wash., assignors to Proctor & Associates Co., Redmond, Wash.

Filed Dec. 3, 1981, Ser. No. 327,063
Int. Cl.³ H04M 15/18
U.S. Cl. 179—7.1 R 17 Claims



1. A method for determining the line number of a calling subscriber line in a group of subscriber lines connected to an electromechanical telephone switching system of a type consisting of step-by-step and all-relay switching systems, the switching system including: a plurality of line finders for the group, wherein each of the subscriber lines in the group is terminated at a unique location in each of the line finders and wherein each of the line finders is operative to couple one of the subscriber lines to an associated line finder line; and, common control equipment for the group that has connected thereto each of the subscriber lines in the group and that is connected to each of the line finders by a plurality of control leads, the common control equipment being operative to detect a calling subscriber line in the group, to responsively mark the location corresponding to the detected calling subscriber line in each line finder, to select one of the line finders whereupon the associated line finder line is seized, and to cause the selected line finder to find the marked location corresponding to the calling subscriber line, said method comprising the steps of:

detecting the marked location in the selected line finder by monitoring the signal on at least one of the control leads between the common control equipment and the selected line finder; and,

converting the detected marked location into the line number of the calling subscriber line.

4,412,102
KEY TELEPHONE SYSTEM

Seiki Ogawa, Tokyo; Michio Mito, and Tsuyoshi Shinoi, both of Kawasaki, all of Japan, assignors to Nippon Telegraph & Telephone, Tokyo and Nippon Tsushin Kogyo Kabushiki Kaisha, Kawasaki, both of, Japan

Continuation-in-part of Ser. No. 178,950, Aug. 18, 1980. This application Jul. 1, 1981, Ser. No. 279,262
Claims priority, application Japan, Aug. 20, 1979, 54/104921; Aug. 20, 1979, 54/113353; Aug. 20, 1979, 54/113354
The portion of the term of this patent subsequent to Aug. 31, 1999, has been disclaimed.
Int. Cl.³ H04M 9/06; H04Q 5/18
U.S. Cl. 179—99 M 6 Claims

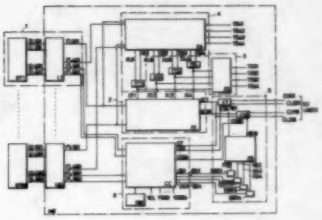
1. In a key telephone system comprising a main equipment connected to a plurality of central office lines and a plurality of key telephones connected to said main equipment, an arrangement in which said main equipment comprises

(a) a central-office-line interface circuit connected to said central office lines,

(b) a key-telephone interface circuit connected to each of said plurality of key telephones,

(c) a first switching matrix including columns, at least some of which are connected to said central-office-line interface circuit and others of which are connected to an intercom trunk circuit, and rows connected to respective said key-telephone interface circuits,

(d) a second switching matrix including columns connected to said central-office-line interface circuit, and rows connected to a dual-tone multifrequency sending circuit,



(e) a third switching matrix including rows connected to said columns of the first switching matrix which are connected to said intercom trunk circuit and columns connected to a tone source,

(f) a fourth switching matrix including columns connected to said intercom trunk circuit and tone source and rows connected to said key-telephone interface circuits, and

(g) a main controlling means connected to the key-telephone interface circuit and duel-tone multifrequency sending circuit and to respective control leads of the first, second, third and fourth switching matrixes for controlling said switching matrixes to perform selected cross-point switching in response to a call request signal.

4,412,103
DIAPHRAGM FOR AN ELECTRO-ACOUSTIC TRANSDUCER

Kiyonobu Fujii, Okayama; Kotaro Ikeda, Ashiya; Kenji Okuno, Kurashiki; Koichi Saito, Kurashiki, and Osamu Ohara, Kurashiki, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Mar. 19, 1982, Ser. No. 360,001
Claims priority, application Japan, Mar. 20, 1981, 56-40662; Apr. 2, 1981, 56-50367; Jun. 30, 1981, 56-102666
Int. Cl.³ C10K 13/00; C08K 3/34
U.S. Cl. 179—115.5 R 12 Claims

1. A moving coil loudspeaker comprising a diaphragm for an electro-acoustic transducer wherein said diaphragm comprises a sheet formed from a mixture of a polymer and mica, wherein said sheet comprises:

(a) 30 to 95% by weight of a polymer selected from the group consisting of polyolefins, polyesters, and polyamides; and

(b) 5 to 70% by weight of mica having a weight-average flake diameter of no more than 500 microns and a weight-average aspect ratio of at least 10.

4,412,104

RECTANGULAR MAGNETIC CIRCUIT FOR SPEAKER

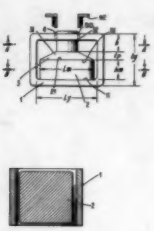
Osamu Fujita; Noriaki Goshi; Shinya Okayasu; Motoharu Shimizu, and Nobuo Kakinuma, all of Saitama, Japan, assignors to Hitachi Metals, Ltd., Japan

Filed Nov. 21, 1979, Ser. No. 96,399

Claims priority, application Japan, Nov. 24, 1978, 53-145037; Nov. 24, 1978, 53-161595[U]; Nov. 24, 1978, 53-161597[U]; Nov. 25, 1978, 53-162480[U]; Nov. 25, 1978, 53-162481[U]; Jan. 10, 1979, 54-1512[U]

Int. Cl.³ H04R *9/02*

U.S. Cl. 179—117 **8 Claims**



1. Magnetic circuit for a loudspeaker having a circular type of movable coil, comprising a rectangular yoke having a hollow penetrating opposed lateral surfaces of a substantial parallelepiped and a circular through-hole in the upper yoke wall, a substantially parallelepiped sintered magnet with its bottom surface connected with the internal surface of the bottom of said rectangular yoke, and a polepiece composed of a columnar shape and having a cylindrical upper part extending into said through-hole, and a lower part having a bottom surface connected to the upper surface of said magnet said sintered magnet having dimensions containable in said rectangular yoke, an air gap being formed between said polepiece and the annular edge surface of said through-hole, the movable coil being disposed in said air gap, wherein said sintered parallelepiped magnet is selected from the group consisting of ferrite magnet and rare earth magnet having a recoil permanence coefficient μr from 1.0 to 1.2 and having the following dimensions:

$$\frac{\text{Width of permanent magnet } Wm}{\text{Width of rectangular yoke } Wy} = 0.8\text{–}0.9$$

$$\frac{\text{Length of permanent magnet } Lm}{\text{Length of rectangular yoke } Ly} = 0.8\text{–}0.9$$

and wherein the cross-sectional area of said upper section of said polepiece is smaller than that of the bottom surface of said lower part, and the lower part bottom surface area of said polepiece is smaller than that of the upper end surface of said parallelepiped sintered magnet.

4,412,105

LASER MICROPHONE

Ralph P. Muscatell, 2007 NE. 20th Ave., Fort Lauderdale, Fla. 33305

Filed Mar. 8, 1982, Ser. No. 355,898

Int. Cl.³ H04R *17/02*

U.S. Cl. 179—121 R **37 Claims**

1. A microphone for converting sound waves into corresponding electrical signals comprising:

an inner housing;

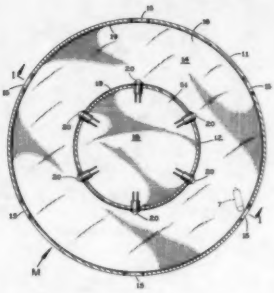
an outer housing extending around said inner housing, said outer and inner housings defining a space between them;

a laser operatively arranged to project coherent monochromatic light into said space between the outer and inner housings;

light reflective means for reflecting the light from said laser in said space;

said outer housing having a plurality of openings for admitting sound to modulate the light in said space;

said openings disposed equidistantly along the perimeter of said outer housing and in a generally horizontal plane, said



openings numbered sequentially, beginning with number one;

and a plurality of electro-optical photo detectors exposed to the modulated light at different locations in said space;

said plurality of photo detectors equal to said plurality of openings, and numbered sequentially, beginning with number one, each photo detector operatively responsive to each same numbered opening.

4,412,106

HIGH FIDELITY STEREOPHONIC REPRODUCTION SYSTEM

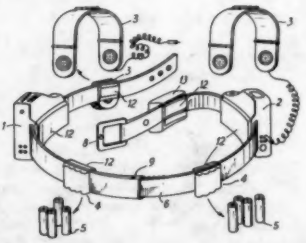
Andreas Pavel, Via Visconti di Modrone 14/A, Milan, Italy

Continuation of Ser. No. 47,967, Jun. 12, 1979, abandoned, which is a continuation-in-part of Ser. No. 889,664, Mar. 24, 1978, abandoned. This application May 19, 1981, Ser. No. 265,124

Claims priority, application Italy, Mar. 24, 1977, 21625 A/77

Int. Cl.³ H04B *1/04*

U.S. Cl. 179—156 R **17 Claims**



1. A personal stereo audio listening system, to be worn by at least one individual listener, comprising the combination of:

(i) a miniaturized programme source device arranged to produce simultaneous mutually different stereo programme output signals;

(ii) first miniaturized stereo amplifier means impedance matched to, and connected to receive stereo output signals from said source device;

(iii) at least one microphone;

(iv) second miniaturized amplifier means impedance

matched to and connected to receive output signals from said at least one microphone;

(v) miniaturized mixer means impedance matched to and connected to receive output signals from said first and second amplifier means, for mixing of output signls originated simultaneously by said source device and by environmental sounds;

(vi) stereo third miniaturized amplifier means impedance matched to and connected to receive the outputs of said mixer means;

(vii) miniaturized open-air type lightweight stereo headphone means impedance and sensitivity matched to and connected to receive the output signals of said third amplifier means;

(viii) volume adjusting means for the signals received by said headphone means;

(ix) power source means comprising a battery electrically connected to said first, second and third amplifier means and to said source device and to said mixer means, and

(x) a support for wear on the body, said support carrying said source device, said first, second and third amplifier means, and said battery power source means.

4,412,107

ELECTRICAL CONDUCTOR

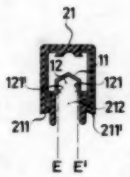
Willi Hillmann, Kamen, Fed. Rep. of Germany, assignor to Paul Vahle GmbH & Co. KG, Kamen, Fed. Rep. of Germany

Filed Jul. 9, 1981, Ser. No. 281,642

Claims priority, application Fed. Rep. of Germany, Jul. 9, 1980, 8018414[U]

Int. Cl.³ B60M *1/34*

U.S. Cl. 191—23 A **5 Claims**



1. Electrically insulated single pole current-conductive conductor comprising: an elongated electrically conductive rail formed with a longitudinally extending track for a sliding current take-off; said track being bounded by two lateral faces, and an electrically insulating casing surrounding said rail and having lateral edge portions engaging said rail but permitting access to said track by leaving a passage for current take-off, said lateral faces being located in respective planes which are inwardly offset relative to said edge portions to avoid contact of the latter with a current take-off in said track, said lateral edge portions projecting over the current rail in direction of the current take-off, so that the current take-off is prevented from contacting said edge portions to avoid wear of said casing and thereby increase the service life of said rail.

4,412,108

ELECTRICAL SWITCH AND ACTUATING MECHANISM THEREFOR

Patrick R. McCarty, New Cumberland, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Dec. 7, 1981, Ser. No. 327,666

Int. Cl.³ H01H *19/00, 21/00, 23/00*

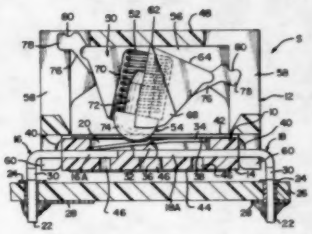
U.S. Cl. 200—5 R **12 Claims**

1. An actuating mechanism, comprising:

housing means having a top section and side sections, said side sections having openings therealong at spaced intervals, said openings extending inwardly into said top section, said openings in one of said side sections and said top section being in alignment with respective ones of said openings in the other of said side sections;

frame means connected to said housing means, said frame means having projection means;

actuating means mounted in said housing means at locations therealong where opposing openings in said side sections are located, said actuating means including rocker means and spring-biased means, said rocker means having pivot means, said spring-biased means extending between said frame means and said rocker means thereby urging said pivot means against an inner surface of said top section;



arm means extending outwardly from said rocker means and disposed in respective ones of the aligned openings, said arm means including section means disposed in said openings, said section means being engageable through said openings in said side sections or through said openings in said top section to move said rocker means from one position with said spring-biased means on one side of said projection means to another position thereby moving said spring-biased means to the other side of said projection means.

4,412,109

PUSH BUTTON SWITCHES HAVING CONTACT STRUCTURES TO AVOID DETENT ACTION AND TO ENHANCE BREAK-BEFORE-MAKE ACTION

William J. Schaad, Winnetka; Charles E. Black, III, Mount Prospect, and Raymond T. Halstead, Wheeling, all of Ill., assignors to Indak Manufacturing Corp., Northbrook, Ill.

Division of Ser. No. 287,690, Jul. 28, 1981, Pat. No. 4,392,029. This application Sep. 23, 1982, Ser. No. 421,819

Int. Cl.³ H01H *15/00*

U.S. Cl. 200—16 C **4 Claims**

1. An electrical switch comprising

a movable carriage,

a contactor mounted on said carriage,

a casing having means for guiding said carriage for movement along a predetermined path,

and first and second coplanar contact plates slidably engageable by said contactor,

said plates having adjacent edge portions with a gap therebetween,

said contactor having a portion in the form of a cylindrically curved bead-shaped rider slidable across said gap and oriented transversely to the path of said contactor,

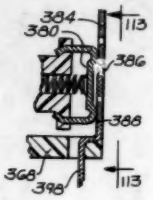
the edge portion of one of said plates having a finger-like projection thereon extending across said gap for smoothly carrying the rider of said contactor across said gap,

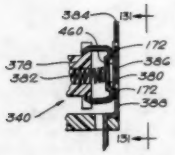
the edge portion of the other plate having a notch therein opposite said projection for maintaining spacing between said projection and said other plate,

said projection and said notch being generally centered relative to the width of said rider for smoothly carrying the central portion of said rider across said gap while avoiding any detent action between said rider and said gap.

3. An electrical switch, comprising

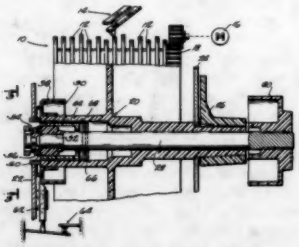
a casing;
a carriage movable in said casing along a predetermined path;
first, second and third conductive contact plates disposed in said casing along said path;
and a conductive contactor mounted on and movable with said carriage for selectively forming a bridging connection between said first and second contact plates and alternatively between said second and third contact plates;
said contactor having a pair of cylindrically curved bead-





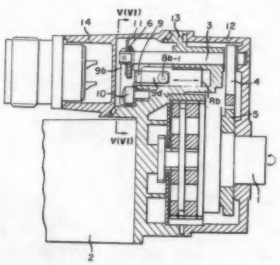
shaped contact riders oriented transversely to said path for slidably engaging said contact plates;
said second contact plate having a rib projecting from the surface of said second plate and extending longitudinally thereon along the path of said contactor for slidable engagement by said contact riders to tilt said contactor away from said first and third contact plates as said contact riders are moved alternatively out of contact with said first and third contact plates and into contact with said rib for enhancing the break-before-make action of said contactor relative to said first and third contact plates.

4,412,110
TIMER CLUTCH
Guy A. Wojtanek, Franklin Park, Ill., assignor to The Singer Company, Stamford, Conn.
Filed Apr. 22, 1982, Ser. No. 370,612
Int. Cl.³ H01H *43/00*
U.S. Cl. 200—38 R **5 Claims**



1. In a timer including a program cam drum having a hollow hub rotatably mounted between support plates, a shaft mounted in said drum for axial movement between first and second positions, switch means for controlling the application of power to said timer, and switch actuating means on one end of the shaft, the improvement comprising,
a sleeve between the shaft and the drum hub adjacent said one end of the shaft,
means rotatably connecting the sleeve to the drum hub,
a plurality of axially extending teeth on one end of the sleeve, and
a pin mounted in a transverse hole through the shaft inside the hub, the pin being free to rotate within the hole and retained lengthwise in the hole by engagement of its ends with the interior of the hub,
said pin being axially spaced from the confronting end of the sleeve in said first axial position of the shaft and engaging said teeth in the end of the sleeve when the shaft is in said second axial position.

4,412,111
LIMIT SWITCH MECHANISM
Hirotoshi Yasuoka, Nagoya, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Jul. 2, 1982, Ser. No. 394,861
Claims priority, application Japan, Jul. 21, 1981, 56-108305[U]
Int. Cl.³ H01H *3/16, 21/28*
U.S. Cl. 200—47 **5 Claims**



1. A limit switch mechanism for coaction with a driver for limiting movement of said driver to a predetermined range, said mechanism comprising:
a shaft rotatable about a first axis and operatively connected to said driver for rotational movement in response to movement of said driver;
a cam mounted on one end of said shaft for movement therewith;
a switch drive arm, said switch drive arm having at least one elastic cam arm positioned so as to be engaged and moved by said cam during rotation of said shaft, and a switch arm movable with each said cam arm, said switch arm having a first portion extending toward said shaft and a second portion extending parallel to said shaft, whereby said switch arm is relatively closer to said shaft than said cam arm; and
a switch for each said switch arm, each said switch having at least a longitudinal and transverse dimension and being operative to limit the movement of said driver, the longer of said dimensions extending parallel to said first axis, each said switch having an actuating pushbutton positioned adjacent said second portion of one said switch arms such that said pushbutton is engaged by said second portion upon the movement of said arm by said cam,
whereby the width of said mechanism is reduced.

4,412,112

DRAWER-TYPE CIRCUIT BREAKER

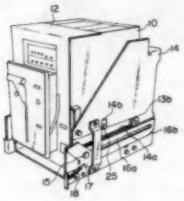
Takayoshi Ishikawa; Yasushi Genba; Shigemi Tamaru, and Kiyoshi Eguchi, all of Hiroshima, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Hiroshima, Japan

Filed Apr. 13, 1982, Ser. No. 368,065

Claims priority, application Japan, Apr. 14, 1981, 56-54081[U]; Apr. 14, 1981, 56-54082[U]

Int. Cl.³ H01H 9/20

U.S. Cl. 200—50 AA 1 Claim



1. A drawer-type circuit breaker comprising a housing having a pair of horizontally disposed guide slots and a pair of vertically extending notches intersecting said slots respectively, circuit breaker means having roller means thereon extending into said slots in engagement with the edges thereof for supporting said circuit breaker means in said housing, an actuating lever pivotally mounted on each side of said circuit breaker means for pivotal movement on a horizontal axis, a guide roller projecting from one end of each lever for travel along a respective one of said slots and intersecting notches, first stop means on said breaker means engagable by the opposite ends of said actuating levers for locating said guide rollers in said slots for movement along said slots during withdrawal or insertion of said breaker means in said housing, second stop means on said housing adapted to engage each actuating lever during insertion of said breaker means to align each guide roller with each notch so that upon pivoting each lever said guide roller thereon will enter a respective notch to move said circuit breaker means further into said housing and third stop means engagable by each lever to limit pivotal movement thereof and maintain each guide roller in a respective notch in the final inserted position.

4,412,113

DUST VENTING CONTACT WITH A NON-CIRCULAR HOLE

Itaru Mitsugi, Uji; Shunzo Oka, Hirakata; Yoshinobu Nakagawa, Hirakata, and Kenichi Shibo, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 176,271, Aug. 8, 1980, abandoned. This application Aug. 4, 1982, Ser. No. 405,108

Claims priority, application Japan, Aug. 10, 1979, 54-110666[U]

Int. Cl.³ H01H 1/18

U.S. Cl. 200—67 DB 5 Claims

1. A switch comprising:

a case having a recessed space therein;

a central fixed contact disposed at the center of the bottom face of said recessed space;

at least one peripheral fixed contact fixedly disposed at a peripheral part of the bottom face of said recessed shape;

a movable contact of resilient metal which is partially hemispherically shaped with a central portion movable between a normal state where said resilient metal is unflexed and no force is applied thereto and a strained state where said central portion is pushed down;

an actuation member having a pushing part movable in engagement with said central portion of said moving contact;

the improvement comprising said central portion of said moving contact having an opening, said opening having a peripheral edge at least a portion of which projects into said opening whereby said opening is non-circular.

4,412,114

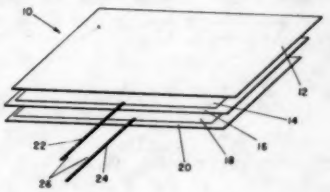
ELECTRICAL SWITCH

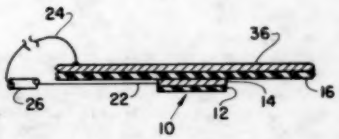
John Arbeeny, 6011 Craig St., Springfield, Va. 22150

Filed Mar. 3, 1982, Ser. No. 354,316

Int. Cl.³ H01H 35/00

U.S. Cl. 200—61.08 6 Claims





1. A electrical switch comprising;

an electric insulator formed as a continuous sheet and adapted to be penetrated by a manually held probe,

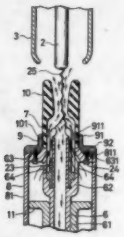
a first electrical conductor mounted on one side of said electric insulator, and

a second electrical conductor similar to said first electrical conductor mounted on the opposite side of said electric insulator for causing contact between said first electrical conductor and said second electrical conductor, upon rupture of said insulator, to close said switch, said first and second electrical conductors comprising soft, flexible, metal foil adapted to be penetrated by a manually held probe.

4,412,115
CIRCUIT INTERRUPTER

Michiharu Okuno, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1981, Ser. No. 238,900
Claims priority, application Japan, Feb. 28, 1980, 55-26079[U]
Int. Cl.³ H01H 33/88
U.S. Cl. 200—148 A 12 Claims



1. A puffer type gas circuit breaker comprising: a pair of terminals; a pair of separable contacts which are electrically connected to respective ones of said terminals; a pair of arcing contacts which are electrically connected to respective ones of said terminals and are disposed to be separated from each other after the separation of said separable contacts at the time of interruption, at least one of said arcing contacts having a plurality of fingers; a puffer cylinder; and a piston fitted slidably in said puffer cylinder for compressing gas in said puffer cylinder in cooperation with said puffer cylinder at the time of interruption to such an extent that at the time of interruption the compressed gas is capable of blowing out an arc generated between said arcing contacts; a gas guide provided inside and adjacent to said fingers of said arcing contact, said gas guide defining with said fingers passageways for gas to be blown against said arc, said gas contacting said fingers prior to reaching said arc.

4,412,116
CIRCUIT BREAKER WITH UNITARY ACTUATING SHAFT

Gregory J. Golub, Athens, Ga., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 26, 1982, Ser. No. 382,251
Int. Cl.³ H01H 19/52, 77/08
U.S. Cl. 200—155 R 6 Claims

1. An electric switch comprising:

a dielectric housing including at least one housing section having side walls and an end wall;

spaced stationary contact structures for each housing section extending through the side walls and into the housing interior;

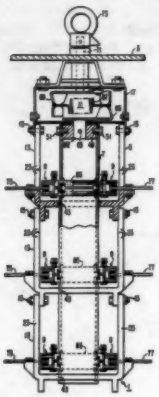
a dielectric, hollow actuating shaft within the housing with one end of the shaft being journally-mounted in an opening in the end wall and the shaft being rotatable between open and closed circuit positions;

a movable contact structure for each housing section mounted within the shaft and including a pair of parallel conductors having end portions clampingly engaging corresponding stationary contact structures when the shaft is in the closed circuit position;

rotatable driving means for turning the shaft between the open and closed circuit positions;

the shaft having aperture means, and the conductor extending through the aperture means; and

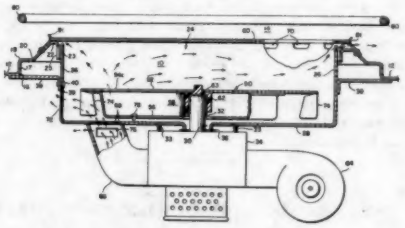
each parallel conductor being mounted within a channel comprising a base and opposite flanges, each flange having notch means for contact with the shaft for preventing longitudinal shifting of the conductor.



4,412,117
MICROWAVE OVEN FEED SYSTEM

Kenneth W. Dudley, Sudbury; Wesley W. Teich, Wayland, and Robert F. Bowen, Burlington, all of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 146,561, May 5, 1980, Pat. No. 4,350,859.
This application Sep. 10, 1981, Ser. No. 301,055
Int. Cl.³ H05B 6/72, 6/76
U.S. Cl. 219—10.55 F 8 Claims



1. A self-clean combination microwave conventional heat oven comprising:

a conductive enclosure for exposing bodies to microwave energy comprising a plurality of metallic surfaces, the bottom surface having an orifice;

a tunnel extending through said orifice into said enclosure;

said bottom surface around said tunnel having a raised portion comprising first and second surfaces parallel to said tunnel, at least a portion of said second surface being above the top of said first surface;

the distance from said first surface to said tunnel being approximately one quarter wavelength of said energy from said tunnel;

the distance of said second surface being less than one quarter inch from said tunnel;

a primary radiator of microwave energy positioned in said tunnel;

means for heating said enclosure;

means for coupling microwave energy to said primary radiator;

a metal bracket for attaching said surface to said tunnel, said

bracket and said tunnel having a connection having poor thermal conductivity;

said tunnel having cross-sectional orthogonal dimensions greater than a free space wavelength of said energy; and

a microwave transparent layer substantially separating the interior of said tunnel from the interior of said enclosure, said layer providing thermal insulation to suppress the temperature in said tunnel from reaching self-cleaning temperatures created by said heating means.

4,412,118

WIRE-CUT, ELECTRIC DISCHARGE MACHINE

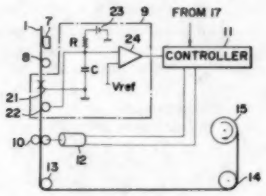
Yoshiyuki Nomura, and Kanemasa Okuda, both of Hino, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Filed Jun. 10, 1981, Ser. No. 272,190

Claims priority, application Japan, Jun. 30, 1980, 55-89386

Int. Cl.³ B23P *1/08*

U.S. Cl. 219—69 W **3 Claims**



1. A wire-cut, electric discharge machine for cutting a workpiece into an arbitrary configuration by discharging a voltage between the workpiece and a wire installed on a wire running system, said wire running system having a wire supply reel, a guide means for guiding the wire from the supply reel, a lower guide means for guiding the wire from the guide means to the workpiece, an upper guide means for guiding the wire from the workpiece and away from the supply reel, a wire feed means for feeding the wire from said upper guide means and a take up means for receiving the wire from the feed means, said machine comprising:

a wire breakage detector means for detecting the breakage of the wire and for providing a breakage signal responsive to the breakage of the wire;

auxiliary wire feed means, operatively connected to the wire breakage detector means, for feeding the wire in a direction away from the workpiece and toward the supply reel in response to the breakage signal; and

a wire detector operatively connected to the auxiliary wire feed means, for detecting, at a predetermined position, the extreme end of the broken wire fed in the direction away from the workpiece and for applying a detection signal to the auxiliary wire feed means to stop the feed of the broken wire by the auxiliary wire feed means, said wire detector means including

a wire detecting brush for contacting the wire,

a feed pin for contacting the wire and for detecting the wire,

a capacitor connected in parallel with the wire between the wire detecting brush and the feed pin,

a power source connected in series with the capacitor,

means for receiving a reference voltage, and

a voltage comparator operatively connected to the wire detecting brush and the reference voltage for comparing a voltage across the capacitor with the reference voltage and for generating the detection signal.

4,412,119

METHOD POR DRY-ETCHING

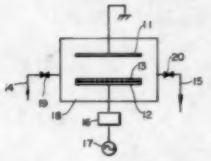
Hideo Komatsu, Hinodemachi; Shinya Iida, Tama; Tatsumi Mizutani, Kodaira, and Kazuyoshi Ueki, Ohme, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 5, 1981, Ser. No. 260,813

Claims priority, application Japan, May 14, 1980, 55-62815

Int. Cl.³ H01L *21/306*

U.S. Cl. 219—121 PF **16 Claims**



1. A drying-etching method for working the surface of a workpiece by the use of a glow discharge plasma comprising: a step of positioning a workpiece within a reaction chamber, a step (i) of introducing into said reaction chamber from the outside helium gas that is inactive with said workpiece even under a plasma discharge; and a step (ii) of effecting the plasma discharge in said reaction chamber so that a reactive gas that is reactive with said workpiece under the plasma discharge is liberated from a material which is arranged in said reaction chamber.

4,412,120

MACHINE FOR CUTTING SHEET MATERIAL

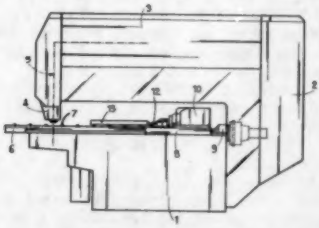
Louis Duruz, Romanel, and Alfred Furrer, Winterthur, both of Switzerland, assignors to Raskin, S.A., Cheseaux, Switzerland

Filed Oct. 23, 1981, Ser. No. 314,192

Claims priority, application Switzerland, Oct. 23, 1980, 7907/80

Int. Cl.³ B23K *27/00*

U.S. Cl. 219—121 LG **6 Claims**

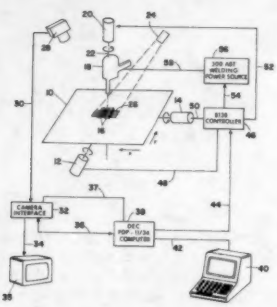


1. A machine for cutting sheet material by means of a laser beam, which machine comprises a movable support frame for a sheet to be cut which is movable both longitudinally and transversely relative to a supporting stationary table and opposite to a stationary working head of the machine, said support frame being arranged to receive the sheet of material to be worked, the arrangement being such that cut-out worked members or the waste do not have to be separated from the sheet during working.

4,412,121
IMPLEMENT POSITIONING APPARATUS AND PROCESS

Jan H. Kremers, Boulder Creek, and Robert C. Bolles, Mountain View, both of Calif., assignors to S R I International, Menlo Park, Calif.

Filed Aug. 28, 1981, Ser. No. 297,514
Int. Cl.³ B23K *9/10*
U.S. Cl. 219—124.34 **14 Claims**



1. A process for controlling positioning of an implement relative to a workpiece, which comprises:

projecting a light pattern including an array of light elements, each having a known shape and spacing relative to one another, on the workpiece,

sensing the array of light elements as reflected from the workpiece,

clustering the sensed light elements into groups based on at least one common characteristic resulting from workpiece geometry of the light elements as reflected,

defining a plurality of surfaces of the workpiece geometry by fitting a mathematical surface to at least some of the clustered groups of sensed light elements,

defining the workpiece geometry from at least some of the defined surfaces, and

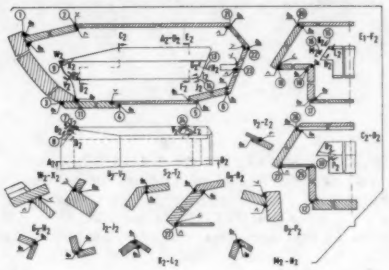
controlling the positioning of the implement and the workpiece relative to one another based on the so-defined workpiece geometry.

4,412,122
METHOD FOR WELDING BODIES MADE OF VERY HARD OR GREATLY REFINED ARMORED STEEL, RESPECTIVELY, AND STRUCTURES MADE ACCORDING TO THIS METHOD

Günter Böhm, Witten, and Wolfram Funk, Groshansdorf, both of Fed. Rep. of Germany, assignors to Thyssen Industrie Ag Maschinenbau, Witten, Fed. Rep. of Germany

Filed Jul. 10, 1978, Ser. No. 926,962
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1977, 2730826
Int. Cl.³ B23K *35/34*
U.S. Cl. 219—137 R **35 Claims**

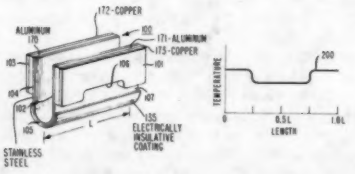
1. Method for welding bodies made of very hard or highly refined armor steel, particularly objects to be armored against the penetration of projectiles, flying bodies, splinters or the like, characterized in that armor steel bodies (e.g. **28**) arranged in juxtaposition with a gap (A) therebetween are provided, in the region of the root of the joint, with preferably one bar each (e.g. **31**), and/or a filler body of, in particular, an unalloyed steel is arranged in the joint so as to cover the joint gap (A), whereupon the armor steel bodies (e.g. **28, 29**) are welded together without preheating with a suitable ferritic welding material—of like base—under a protective gas atmosphere and after cooling of the weld seam from the welding heat to not less than 100° C., the weld seam is heated locally and progressively without any holding period to at least 450° C. and subsequently, without maintaining a certain ambient temperature and/or period of time, the weld seam is cooled to ambient temperature in air, or a like-base layer of armor is locally applied onto a wall of armor steel from a suitable ferritic welding material in that the welding area which has been cooled from the welding heat to no less than 100° C. is heated locally and progressively without any holding period to at least 450° C. and subsequently the weld region is cooled in air without maintaining a certain time period and only the last (uppermost) welded layer of the weld region is again locally reheated, before being cooled from the welding heat to below 100° C. to at least 450° C. without holding period and subsequently again cooled in air to ambient temperature without maintaining a certain time period and/or temperature.



4,412,123
LAMINATED ELECTRIC HEAT GENERATING MEMBER FOR REFLOW SOLDERING DEVICES

Hans H. Ammann, Chester; Rocco Bonanni, Wayne, and Werner Engelmaier, Mendham, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 9, 1980, Ser. No. 148,505
Int. Cl.³ B23K *3/02*; H05B *3/00*
U.S. Cl. 219—233 **6 Claims**



1. Apparatus for heating a plurality of spaced elements comprising:

an elongated metal laminate of substantially U-shaped cross section having a bight portion between two side portions, said laminate including a layer of aluminum between a layer of copper and a layer of stainless steel, the layers being roll bonded together, the copper and aluminum layers being removed at the bight portion to expose the stainless steel layer for contacting the plurality of spaced elements, the edges of said copper and aluminum layers adjacent to said bight portion being shaped to impart a selectable temperature profile along the length of said bight portion; and

an electrical current source and means for applying electrical current from the source to the copper and aluminum layers.

4,412,124

ELECTRODE UNIT FOR ELECTRICALLY HEATING UNDERGROUND HYDROCARBON DEPOSITS

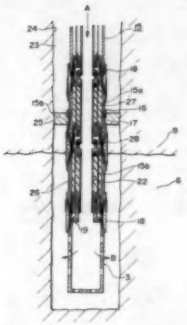
Toshiyuki Kobayashi, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Hyogo, Japan

Filed Jun. 2, 1981, Ser. No. 269,180

Claims priority, application Japan, Jun. 3, 1980, 55-75208; Jun. 3, 1980, 55-75209; Jun. 3, 1980, 55-75210; Jun. 3, 1980, 55-75212; Jun. 3, 1980, 55-75213; Jun. 3, 1980, 55-75214

Int. Cl.³ H05B *3/03;* **E21B** *36/00, 43/24;* **H01R** *4/60*

U.S. Cl. 219—277 **11 Claims**



1. An electrode unit for electrically heating underground hydrocarbon deposits comprising: a main conduit pipe; a cylindrical water pipe disposed within and coaxially to said main conduit pipe; a cylindrical electrical conductor disposed between said water pipe and said main conduit pipe; and a solid heat insulating material disposed in spaces between said water pipe and said main conduit pipe.

4. The electrode unit of claim 1 further comprising first and second connectors for connecting electrical conductors between adjacent electrode units, said first and second connectors being disposed at the opposite ends of said electrode unit, said first connector comprising a ring-shaped connecting terminal disposed coaxially between said water pipe and said main conduit pipe, and said second connector comprising a plurality of contactors arranged cylindrically and movable radially adapted for making contact with a ring-shaped connecting terminal of an adjacent electrode unit while providing a predetermined contact pressure, said contact is being coupled to said electrical conductor through a second ring-shaped connecting terminal arranged coaxially with said water pipe at said second end.

4,412,125

HEAT-SHRINKABLE COVER

Toshio Nagasawa, and Yoshio Nishihara, both of Kyoto, Japan, assignors to Ube Industries, Ltd., Tokyo, Japan

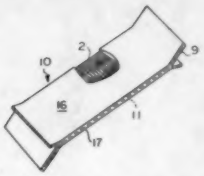
Division of Ser. No. 177,447, Aug. 11, 1980, Pat. No. 4,370,548. This application Sep. 27, 1982, Ser. No. 424,092

Claims priority, application Japan, Aug. 14, 1979, 54-102792

Int. Cl.³ H05B *3/36, 3/10*

U.S. Cl. 219—549 **13 Claims**

1. A heat-shrinkable cover comprising a heat-shrinkable synthetic resin member and an electrical heating element combined with the heat-shrinkable synthetic resin member substantially over the entire region thereof, wherein the electrical heating element comprises a web of a synthetic resin having a plurality of flexible metal conductor wires arranged therein in parallel to one another along the longitudinal direction of the web, said web being folded in succession at predetermined intervals along folding lines inclined at a small acute angle to the transverse direction of the web to form a two-layer rectangular sheet, and the direction of the folding lines forming the side edges of the two-layer rectangular sheet of the electrical heating element is substantially in agreement with the direction



of heat shrinkage of the heat-shrinkable synthetic resin member.

4,412,126

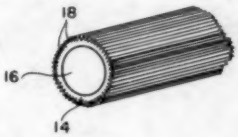
INFRARED SOURCE

Richard J. Brockway, Amherst, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 4, 1982, Ser. No. 345,884

Int. Cl.³ H05B *3/10*

U.S. Cl. 219—553 **1 Claim**



1. In an infrared source including a hollow cylindrical integral rod of a material which when heated by passing an electrical current along its length will emit thermal energy by radiation and having a requirement for constant rod length and voltage, means for decreasing the operating temperature of the rod, comprising:

a replacement graphite rod having an increased outside diameter and irregular surface, to decrease cross-sectional areas, to maintain substantially constant resistance and greater emissivity at lower operating temperatures, said irregular surface comprising macroscopic sawtooth grooves.

4,412,127

IN-FOCUS DETECTOR FOR BINOCULAR STEREOSCOPE

Toshihiro Imai, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Japan

Filed Jan. 5, 1982, Ser. No. 337,107

Claims priority, application Japan, May 29, 1981, 56-82250

Int. Cl.³ G01J *1/36*

U.S. Cl. 250—204 **11 Claims**

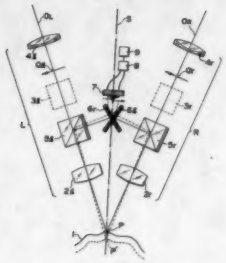
1. An in-focus detector for binocular stereoscope including a pair of left- and right-hand observation optic systems each having an optical axis; comprising:

a pair of beam splitters each disposed on the optical path of a respective one of the observation optic systems for splitting part of observation light passing therethrough and for diverting it out of the associated observation optical path for use in detecting an in-focus condition;

a pair of reflecting elements for directing the light diverted out of the observation output path by the respective beam splitters to a focused position which corresponds to an in-focus condition;

a light receiver disposed at the focused position for simultaneously receiving the light from each of the reflecting elements to produce a photoelectric output in accordance

with an image of an object being examined which is incident thereon;



and an in-focus detection circuit for producing an in-focus signal in response to a photoelectric output from the light receiver.

4,412,128

AUTOMATIC BRIGHTNESS CONTROL CIRCUIT FOR A HIGH VOLTAGE ELECTRICAL POWER SUPPLY

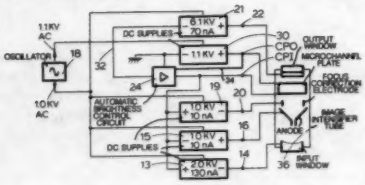
Richard L. C. McDonald, Mitcham, England, assignor to U.S. Philips Corporation, New York, N.Y.

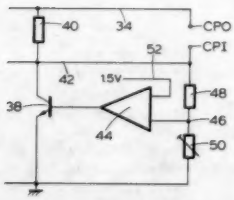
Filed Jan. 29, 1981, Ser. No. 229,418

Claims priority, application United Kingdom, Feb. 4, 1980, 8003613

Int. Cl.³ H01J *31/50*

U.S. Cl. 250—213 VT 9 Claims





9. A high voltage power supply for an image intensifier tube having a microchannel image intensifier plate, said plate having an input end and an output end, said power supply having an automatic brightness control circuit for producing a variable voltage across the ends of the image intensifier plate to vary the brightness of the image intensifier tube in response to a source of a signal which is related to the brightness of the tube, said power supply comprising:

means for generating a high voltage direct current signal which, in operation, is connected to one end of the image intensifier plate; and

an automatic brightness control circuit comprising a series regulating circuit having a transistor operating in class A with a current gain less than unity and with such a low maximum collector current that the risk of thermal runaway which would lead to secondary breakdown is substantially zero, said transistor having an emitter, base, and collector, the emitter and collector being electrically connected in series with a load resistor between ground and the high voltage direct current signal, the base, in operation, being electrically connected to the source of the signal which is related to the brightness of the image intensifier tube, the output of the automatic brightness control circuit being taken at the electrical connection between the transistor and the load resistor, said output, in operation, being connected to the other end of the image intensifier plate.

4,412,129

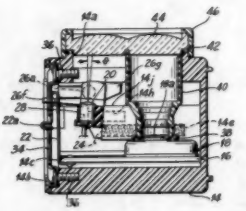
ADJUSTABLE PHOTOELECTRIC DETECTOR HEAD FOR SOLID STATE LIMIT SWITCH

Eugene F. Duncan, Milwaukee, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Apr. 1, 1981, Ser. No. 249,764

Int. Cl.³ H01J *5/02*

U.S. Cl. 250—239 12 Claims



1. A photoelectric detector head for a solid state limit switch, said detector head comprising, in combination:

a housing having a window in one side thereof;

photoelectric detector means within said housing comprising a photoreceiver and a light source;

said photoreceiver being fixedly mounted within said housing and having a field of view directed through said window;

said light source being pivotally mounted within said housing and directed to emit a light beam through said window to intersect said field of view outside said housing; and

adjustment means operable to pivot said light source to change the angle of convergence of said light beam with said field of view of said photoreceiver to thereby vary the distance from said housing at which said light beam intersects said field of view;

said light source comprises a cradle journaled for rotation in said housing and a light emitting device fixedly mounted to said cradle;

an indicator projecting from said cradle toward a side of said housing and providing an indication of the distance from said housing at which said light beam intersects said field of view;

window means in said housing in which said indicator may be viewed; and

indicia on said housing adjacent said window means;

said indicator means and said indicia cooperatively providing an indication of the distance from the housing at which said light beam intersects said field of view; and wherein

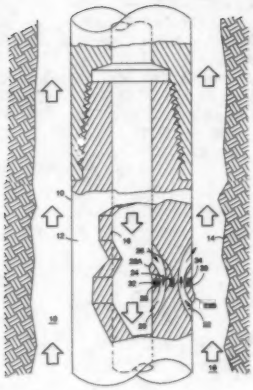
said adjustment means comprises a screw threadably received in said housing and having a portion in cooperating engagement with said cradle to pivotably move said cradle.

4,412,130

DOWNHOLE DEVICE TO DETECT DIFFERENCES IN FLUID DENSITY

Warren J. Winters, Tulsa, Okla., assignor to Standard Oil Company, Chicago, Ill.

Filed Apr. 13, 1981, Ser. No. 253,466
Int. Cl.³ G01V 5/00
U.S. Cl. 250—260 12 Claims



1. Apparatus for indicating the difference in densities between a first and second fluids, comprising:

a housing interconnectable with a conduit string and provided with two approximately equal fluid sampling chambers, a first of said chambers in communication with the interior of said housing and a second of said chambers in communication with the exterior of said housing;

said first fluid passing interiorly of said housing and said second fluid passing exteriorly of said housing;

a radiation source mounted within said housing equidistant between said first and second chambers;

at least two radiation detectors mounted within said housing equidistant from said radiation source with one of said chambers equidistant between one of said radiation detectors and said radiation source;

each of said detectors upon energization produces a signal directly related to the density of the fluid in said chamber to which said detector is adjacent; and

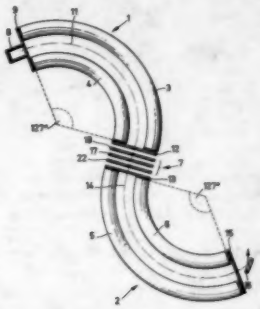
circuit means operably connected to said detectors and responsive to said signals for producing an indication directly related to the difference in densities of said fluids.

4,412,131

MONOCHROMATOR FOR CHARGED PARTICLES

Hermann Froitzheim, Aachen, Fed. Rep. of Germany, assignor to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Mar. 30, 1981, Ser. No. 249,246
Claims priority, application Fed. Rep. of Germany, Apr. 17, 1980, 3014785
Int. Cl.³ H01J 49/48
U.S. Cl. 250—305 5 Claims



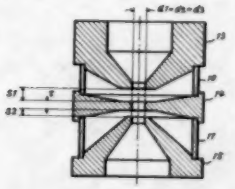
1. A monochromator for charged particles, comprising: two monochromators in tandem and a retarding lens disposed between the two monochromators.

4,412,132

ELECTRON LENS EQUIPPED WITH THREE MAGNETIC POLE PIECES

Katsushige Tsuno, Akishimashi, Japan, assignor to JEOL Ltd., Tokyo, Japan

Filed Jul. 8, 1981, Ser. No. 281,562
Int. Cl.³ H01J 29/64; G01N 23/00
U.S. Cl. 250—396 ML 5 Claims

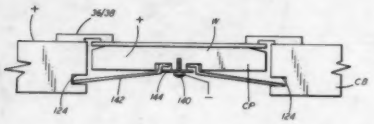


1. An electron lens consisting of upper, middle and lower magnetic pole pieces installed inside a yoke enveloping two excitation coils so that magnetic fields are generated with opposite and same strength excitation in the two gaps respectively between said three magnetic pole pieces, and wherein the spacing ratio S1/S2, in which S1 represents the axial gap between the upper and middle pole pieces and S2 represents the axial gap between the middle and lower pole pieces, is in the range of 2.7 to 3.8 such that radial and spiral distortion are reduced.

4,412,133
ELECTROSTATIC CASSETTE

William A. Eckes, Berkeley; Russell H. Rhoades, Palo Alto; John W. Vorreiter, Sunnyvale; John C. Wiesner, Hayward, and Charles E. Shepard, San Jose, all of Calif., assignors to The Perkin-Elmer Corp., Norwalk, Conn.

Filed Jan. 5, 1982, Ser. No. 337,205
Int. Cl.³ H02N *13/00*; H01J *37/30*
U.S. Cl. 250—492.2 14 Claims



1. An electrostatic cassette assembly for securing and positioning a wafer in a particle beam lithography system so that the upper surface of the wafer is exposed to the particle beam, comprising,

a cassette body having a central opening for receiving said wafer,

retainer means secured in fixed relationship and extending into said opening,

a charge plate fabricated with extreme flatness with a top surface having a relatively thin dielectric formed to be extremely uniform on which the wafer is positioned so that the bottom surface of the wafer engages the dielectric,

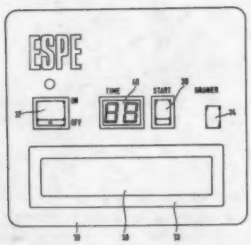
holding means cooperable with said cassette body to force said wafer into contact with said retaining means whereby the wafer is held rigidly in said cassette assembly, and,

means for applying a first potential to the wafer and a second potential of a different value to said charge plate on the side opposite said charge plate from said dielectric to flatten said wafer by Coulombic force whereby the wafer is held both mechanically and electrostatically in said cassette assembly.

4,412,134
APPARATUS FOR IRRADIATING DENTAL OBJECTS

Wolf-Dietrich Herold, Hechendorf; Karl L. Grafwallner, Munich, and Michael Keller, Lochham, all of Fed. Rep. of Germany, assignors to ESPE Fabrik Pharmazeutischer Praeparate GmbH, Seefeld, Fed. Rep. of Germany

Filed Jul. 15, 1981, Ser. No. 283,690
Int. Cl.³ C08F *2/48*; C08G *2/02*; C08U *7/10*
U.S. Cl. 250—504 R 10 Claims



1. An apparatus for treating dental objects with radiation of a selected spectral range, comprising

(a) a housing,

(b) support means including a horizontal glass plate for holding an object and being transparent for radiation of said selected spectral range,

(c) a first lamp for emitting radiation containing said selected spectral range,

(d) a first reflector for reflecting radiation of said selected spectral range, said first lamp and reflector being disposed so as to direct radiation in a substantially transverse direction,

(e) a mirror disposed above said support means to redirect the radiation from said first lamp and reflector to said support means, said mirror being removable to allow access to said support means,

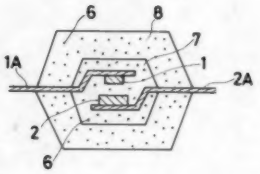
(f) a second lamp disposed below said support means and emitting radiation containing said selected spectral range, and

(g) a second reflector disposed below said support means and reflecting radiation of said selected spectral range substantially upwardly through said glass plate.

4,412,135
PHOTO COUPLER DEVICE MOLDING INCLUDING FILLER PARTICLES

Hidekazu Awaji, Kashihara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 132,794, Mar. 21, 1980, abandoned. This application May 28, 1982, Ser. No. 383,330
Claims priority, application Japan, Mar. 23, 1979, 54-38674[U]; May 25, 1979, 54-65379
Int. Cl.³ G02B *27/00*
U.S. Cl. 250—551 15 Claims



1. A photo coupler device comprising:

a light emitting element and a light receiving element disposed in opposing relationship with respect to each other, and

a unitary layer of synthetic resinous material encapsulating the light emitting element and the light receiving element, said unitary layer containing a substantial amount of filler particles which are held in suspension within said layer in an amount up to about 70 percent by weight based on the weight of said layer, said filler particles having a particle size with a diameter in the range of about several tens to about one hundred μm,

wherein the thickness of the synthetic resinous material between the light emitting element and the light receiving element is small relative to the thickness of the synthetic resinous material separating said elements from the environment, whereby the light transmitting efficiency between the two elements is effectively maintained while substantially eliminating the effects of ambient light upon said elements.

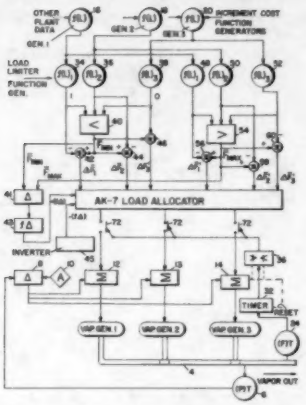
4,412,136
LOAD CONTROL FOR ENERGY CONVERTERS

Azmi Kaya, Akron; Marion A. Keyes, Chagrin Falls, and Thomas J. Scheib, Chesterland, all of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Dec. 15, 1981, Ser. No. 330,995
Int. Cl.³ G06G *7/635*; H02J *3/46*
U.S. Cl. 290—40 R 5 Claims

1. A load control for a system comprised of a plurality of energy converters, comprising, a first means generating a

System Control Signal corresponding to the system load, a second means adjusting in parallel the energy output of each of said converters in accordance with changes in the System Control Signal, means producing an individual incremental cost signal for each of said plurality of converters, means responsive to said last named signals generating (a) a signal corresponding to the difference between the highest and lowest incremental cost, and (b) a signal identifying the generator having said lowest incremental cost and said highest incremental cost and means under the control of signals (a) and (b) increasing the energy output of the converter having the lowest incremental cost and simultaneously decreasing by a like amount the energy output of the converter having the highest incremental cost.

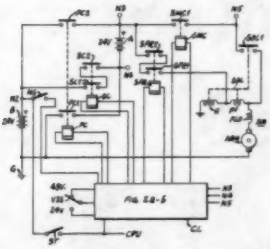


4,412,137

DUAL VOLTAGE ENGINE STARTER MANAGEMENT SYSTEM

James E. Hansen, Oak Creek, and Richard G. Smith, Milwaukee, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 13, 1982, Ser. No. 449,072
Int. Cl.³ B62D *45/00;* **H02G** *3/00*
U.S. Cl. 307—10 R **23 Claims**



1. In a system for starting an internal combustion engine having a starter motor and a standard starter solenoid, the system comprising:

a first battery for or battery pack for supplying operating power to the system;

a second battery or battery pack;

first electrically operable switching means for connecting said first and second batteries in parallel for normal starting;

second electrically operable switching means for connecting said first and second batteries in series for cold weather starting;

an electrically operable starter pilot switch in circuit with said batteries for energizing the standard starter solenoid;

an electrically operable starter motor switch in circuit with said batteries for energizing the starter motor;

means for operating said first switching means to connect said batteries in parallel;

means for selecting a series or parallel batteries starting mode;

means for applying a start signal;

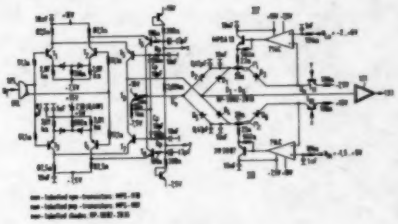
and control means operable when series batteries starting has been selected and responsive to said start signal for opening said first switching means and then closing in predetermined timed sequence said second switching means, said starter pilot switch and said starter motor switch in that order to apply power to the starter motor to initiate a high voltage starting cycle.

4,412,138

PULSE GENERATOR CIRCUIT

Josef Becker, Marbach, Fed. Rep. of Germany, assignor to Hewlett-Packard GmbH, Boblingen, Fed. Rep. of Germany

Filed Dec. 28, 1981, Ser. No. 335,307
Int. Cl.³ H03K *3/295, 5/24, 5/02*
U.S. Cl. 307—264 **3 Claims**



1. A pulse generator circuit for generating pulses with variable upper and lower levels, comprising:

an input for receiving a driving signal;

an output having two complementary terminals where said pulses or logic signals are delivered in response to the driving signal;

first and second variable voltage sources, said first voltage source representing said upper level and said second voltage source representing said lower level;

switching means for alternately connecting the output with one of said voltage sources, said switching means comprising a diode bridge in Graetz rectifier configuration having a first pair of diodes with the cathode leads of said first pair of diodes coupled at a first node, having a second pair of diodes with the anode leads of said second pair of diodes coupled at a second node, having one anode lead of said first pair of diodes coupled to one cathode lead of said second pair of diodes to form a third node corresponding to one terminal of said output, and having the other anode lead of said first pair of diodes coupled to the other cathode lead of said second pair of diodes to form a fourth node corresponding to the other terminal of said output;

first current source means coupled to said input for supplying a constant current to said third node and for supplying an equal but oppositely directed constant current to said fourth node, the directions of said constant currents from said first current source means to said third and fourth nodes being reversible in response to said driving signal;

said first voltage source comprising a first amplifier with a feedback circuit in voltage follower configuration, said feedback circuit comprising a fifth diode oriented with its cathode lead coupled to said first node and to the output

of said first amplifier, said fifth diode having substantially the same characteristics as said diodes comprising said diode bridge;

said second voltage source comprising an amplifier with a feedback circuit in voltage follower configuration, said feedback circuit comprising a sixth diode oriented with its anode lead coupled to said second node and to the output of said second amplifier, said sixth diode and having substantially the same characteristics as said diodes comprising said diode bridge:

second current source means coupled to said fifth diode for supplying a constant current therethrough which is equal in magnitude to said current supplied by said first current source means so that voltage drops in said diode bridge are compensated; and

third current source means coupled to said sixth diode for supplying a constant current therethrough which is equal in magnitude to said current supplied by said first current source means so that voltage drops in said diode bridge are compensated.

4,412,139

INTEGRATED MOS DRIVER STAGE WITH A LARGE OUTPUT SIGNAL RATIO

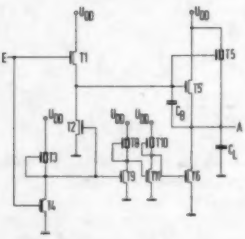
Karlheinrich Horninger, Eglharting, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 4, 1981, Ser. No. 270,342

Claims priority, application Fed. Rep. of Germany, Jul. 16, 1980, 3026951

Int. Cl.³ H03K *3/01, 17/60*

U.S. Cl. 307—270 **4 Claims**



1. A driver stage formed in integrated MOS technology and which has a large output signal ratio, comprising: a first control stage comprising first and second series connected MOSFETs, both of which are of the enhancement type, and with an input at the first MOSFET and an output between the two MOSFETs; a second control stage having first and second MOSFETs, one of which is connected to said input and an output being provided between the two MOSFETs; an output stage comprising a first depletion type MOSFET and a second series connected enhancement type MOSFET with an output connecting between the two, the output of the first control stage connecting to a gate of the first MOSFET and the output of the second control stage connecting to a gate of the second MOSFET; an additional enhancement type MOSFET in the output stage whose source, drain and gate are parallel-connected with the respective source, drain and gate of the first MOSFET of the output stage; a boot strap capacitor connected between the gate of the additional MOSFET and a connection point between the additional MOSFET and second MOSFET of the output stage; a W/L (width-to-length) ratio of the channel of the first MOSFET of the output stage being reduced in size with respect to the W/L ratio of the additional MOSFET, whereby a channel resistance of the output stage first MOSFET is reduced; and between the second control stage signal output acting upon the gate of the second output stage MOSFET and the gate of the second output stage MOSFET there being directly connected two auxiliary inverter stages directly serially connected and each of which is formed of a first auxiliary MOSFET of a depletion type and a second auxiliary MOSFET of an enhancement type.

4,412,140

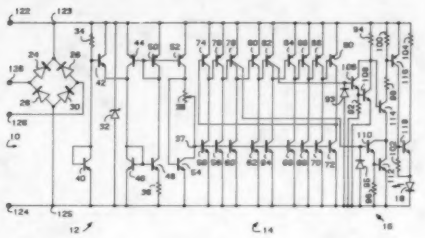
CIRCUIT FOR REDUCING CURRENT TO LIGHT EMITTING DIODE OF OPTICALLY COUPLED DRIVER

David A. Reynolds, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 19, 1981, Ser. No. 322,810

Int. Cl.³ H03K *3/42, 3/01*

U.S. Cl. 307—311 **10 Claims**



1. A circuit for providing periodic light pulses to an optically coupled light responsive device, said optically coupled light responsive device enabling a substantially continuous current path to a load, said circuit comprising:

oscillating means adapted to be coupled to a voltage source for generating a first repetitive signal and a second repetitive signal;

logic means coupled to said oscillating means and responsive to said first and second repetitive signals for generating an output, said logic means including a means for removing photogenerated current therein;

output means coupled to said logic means and responsive to said output for generating a current pulse; and

light emitting means coupled to said output means and responsive to said current pulse for providing said periodic light pulse.

4,412,141

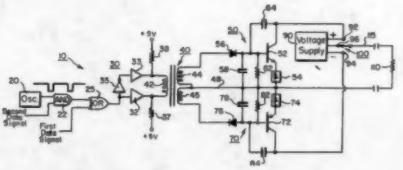
THREE STATE LOOP KEYER

Christian C. Jacobsen, Brookfield, Conn., assignor to General DataComm Industries, Inc., Danbury, Conn.

Filed Dec. 16, 1980, Ser. No. 217,098

Int. Cl.³ H03K *17/04, 17/28*

U.S. Cl. 307—471 **9 Claims**



1. A keying circuit comprising:

an oscillator which produces a binary output signal having an asymmetric duty cycle,

a first logic gate to which is applied the output from said oscillator and a first binary data signal, said logic gate producing an output signal which is the exclusive OR of the oscillator signal and the first data signal applied to its inputs,

a transformer having a primary winding and at least one secondary winding, the output signal from said logic gate being applied to said primary winding,

a signal transmission line connected to one terminal of each secondary winding,

first means connected to a secondary winding of said transformer for connecting a voltage source of a first polarity to said signal transmission line when said first data signal has a first signal polarity, and

second means connected to a secondary winding of said transformer for connecting a voltage source of a second polarity to said signal transmission line when said first data signal has a second signal polarity.

4,412,142

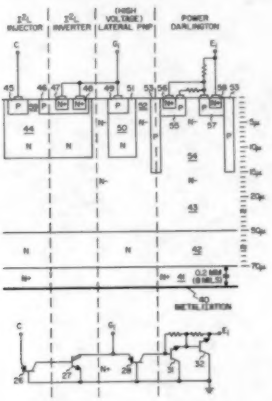
INTEGRATED CIRCUIT INCORPORATING LOW VOLTAGE AND HIGH VOLTAGE SEMICONDUCTOR DEVICES

Louis J. Ragonese; Nicholas A. Schmitz, both of Liverpool; Saverio F. Bevacqua, Fulton, and King Owyang, Baldwinsville, all of N.Y., assignors to General Electric Company, Syracuse, N.Y.

Filed Dec. 24, 1980, Ser. No. 219,824

Int. Cl.³ H01L *27/04;* **H03K** *19/091*

U.S. Cl. 307—477 **14 Claims**



1. An integrated circuit comprising:

A. a monolithic substrate having an underlying highly doped first region of a first conductivity type, a contact on the undersurface thereof, and a second moderately doped region of said first conductivity type overlaying said first region;

B. low voltage control logic including a first, vertical, transistor comprising:

(1) a first underlying emitter of said first conductivity type defined in said second region, and electrically connected to said contact,

(2) a first base of a second conductivity type, disposed upon said first emitter to form a junction therewith,

and

(3) a first collector of said first conductivity type, disposed upon and horizontally bounded by said second base to form a junction therewith;

C. a second, lateral, transistor of high voltage design for coupling said low voltage control logic to high voltage power transistor means, comprising:

(1) a second emitter of said second conductivity type, disposed upon said second region, and coupled to the collector of said first transistor,

(2) a second base of said first conductivity type defined in said second region and in electrical connection with said contact, laterally adjacent to said second emitter to form a junction therewith, and

(3) a second collector of said second conductivity type disposed upon said second region, laterally adjacent to said second base to form a junction therewith, and formed deeply beneath the upper surface of said substrate so as to provide improved high voltage performance and a guard ring between said high voltage power transistor means and said low voltage control logic;

and

D. power transistor means of high voltage design including a third, vertical power transistor, comprising:

(1) a third, underlying collector defined in said second region and electrically connected to said contact,

(2) a third base of said second conductivity type, disposed upon said third collector to form a junction therewith, shielded from said low voltage control logic by said guard ring, and electrically connected thereto, and

(3) a third emitter of said first conductivity type, disposed upon and horizontally bounded by said third base to form a junction therewith.

4,412,143

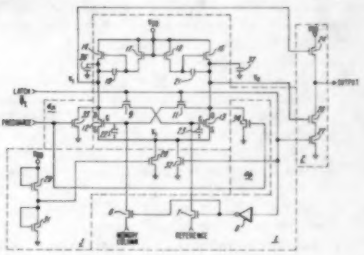
MOS SENSE AMPLIFIER

James F. Patella, Centerville, and Donald G. Craycraft, Spring Valley, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Mar. 26, 1981, Ser. No. 247,683

Int. Cl.³ H03K *5/24;* **G11C** *7/06*

U.S. Cl. 307—530 **9 Claims**



1. A comparator circuit, comprising:

a multivibrator of substantially symmetric organization having first and second conductive paths, each path containing series connected load and amplification elements joined through an intermediate node;

a first means, for selectively coupling said node in said first path with said amplification element in said second path;

a second means, for selectively coupling said node in said second path with said amplification element in said first path;

a third means, for selectively coupling first and second input signals to said amplification elements in said first and second paths;

selectively operable means for biasing the operating voltages of said amplification elements into operative correspondence with said first and second input signal voltages; and

control means, operatively coupled to said first means, said second means, said third means and said selectively operable means for biasing, for decoupling said first and second means concurrent with the coupling of said third means and an operation of said means for biasing, and for coupling said first and second means concurrent with a disabling of said means for biasing in timed sequence thereafter.

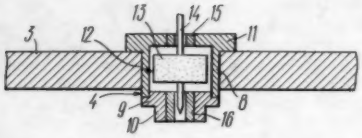
4,412,144
SINGLE-PHASE STEP MOTOR

Vladimir A. Denisov; Elena F. Kulevskaya; Jury S. Zhiltsov; Olga M. Kuznetsova; Zoya D. Novakovskaya; Vyacheslav I. Kozlov; Vyacheslav K. Korol, and Nikolai I. Pershin, all of Moscow, U.S.S.R., assignors to Moskovsky Energeticheskiy Institut; Pervy Moskovsky Cashovoizavod im. S. M. Kirova and V. M. Chasovoi, all of Moscow, U.S.S.R.

Filed Apr. 8, 1982, Ser. No. 366,560

Int. Cl.³ H02K *37/00*

U.S. Cl. 310—49 R **5 Claims**



1. A single-phase stepping motor, comprising:
a stator;
a coil of said stator;
a magnetic circuit of said stator;
a core of said magnetic circuit;
a plate of said magnetic circuit having a hole;
poles of said stator which are magnetically asymmetric and formed by said hole of said plate;
straps interconnecting said poles of said stator;
a rotor;
a shaft of said rotor;
a diametrically magnetized permanent magnet of said rotor;
first and second supports of said shaft of said rotor;
a capsule set in said hole of said plate;
a cover of said capsule;
a body of said capsule having a diameter exceeding the diameter of said hole in said plate by an amount equal to tolerances ensuring interference fit of said capsule in said hole in said plate;
a portion of said body disposed against said cover;
the first support of said shaft of said rotor being arranged in said cover of said capsule;
the second support of said shaft of said rotor being arranged in said portion of said body;
an external cylindrical boss of said capsule, coaxial with said rotor;
a bearing flange of said body of said capsule, which positions said rotor with respect to said poles of said stator.

4,412,145
STATOR FOR AN ELECTRIC MACHINE EXCITED BY PERMANENT MAGNETS

Erich Voss, and Horst Gräfenschnell, both of Bad Neustadt, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jan. 27, 1982, Ser. No. 343,111

Claims priority, application Fed. Rep. of Germany, Feb. 16, 1982, 3105602

Int. Cl.³ H02K *21/26*

U.S. Cl. 310—154 **3 Claims**

1. A stator for use in an electric machine which is excited by permanent magnets, the stator having a bore hole with a circumference and an end face and further comprising:
a plurality of channels at the circumference of the bore hole, each channel having at least two undercuts, said channels extending to and open on the end face;
a plurality of arcuate permanent magnets, each magnet positioned in the bore hole between adjacent channels and each magnet having axially extending lateral edges; and
a spring element in each channel, each spring element having a back part and extensions formed on the back part, each extension engaging an undercut of the respective channel, and each spring element having at least two spring arms connected to its back part, each spring arm

extending around a lateral edge of one arcuate permanent magnet.

4,412,146
ELECTRIC MOTOR CONTROL

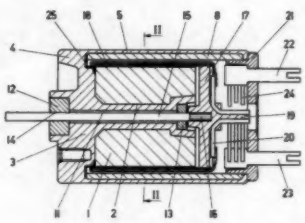
Bodo Fütterer, Luzern; Jurgen Mayer, and Hugo Fritschy, both of Sachseln, all of Switzerland

Continuation of Ser. No. 901,607, May 1, 1978, abandoned, which is a continuation-in-part of Ser. No. 594,768, Jul. 10, 1975, abandoned. This application Oct. 30, 1980, Ser. No. 202,398

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1974, 2433770

Int. Cl.³ H02K *1/22*

U.S. Cl. 310—266 **6 Claims**



1. An electric motor having a bell-shaped rotor and a generally cylindrical stator, the rotor being positioned in an air gap between spaced inner and outer concentric portions of the stator, the stator comprising:
a generally cylindrical permanent magnet, said magnet having a central axial aperture, said magnet defining the inner portion of the stator;
an injection molded element, said injection molded element positioning said magnet in said motor, said molded element having a first portion positioned in, and conforming in shape to, said aperture of said magnet, and having a second portion forming a face plate which engages a first end of said magnet and which extends radially outwardly beyond the periphery of said magnet, said first portion of said molded element having a central bore positioned on the axis of said magnet, said central bore having end portions which carry bearings, said bearings supporting a shaft which passes through said central bore in said injection molded element, said shaft supporting the bell-shaped rotor for rotation in the air gap;
a flux return element concentric with, and spaced radially outwardly from said magnet to define the air gap in which the bell-shaped rotor is positioned, said flux return element being cylindrical with a first end of said flux return element contacting said face plate radially outwardly of said magnet;
a casing, said casing extending from said face plate radially outwardly of, and in intimate engagement with said flux return element, said casing extending beyond a second end of said magnet and terminating in a radially inwardly

turned free end, said free end extending radially inwardly to an extent not exceeding an inner diameter of said flux return element; and,

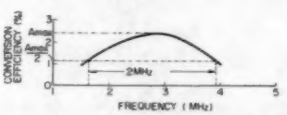
a brush cover, a wall portion of said cover contacting a second end of said flux return element, said radially inwardly turned free end of said casing engaging said wall portion of said brush cover to secure said cover to said casing.

4,412,147

ULTRASONIC HOLOGRAPHY IMAGING DEVICE HAVING A MACROMOLECULAR PIEZOELECTRIC ELEMENT TRANSDUCER

Masato Nagura, Chofu; Kazushige Kikuchi, Tokyo; Hiroshi Obara, and Yasushi Endo, both of Iwaki, all of Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 4, 1980, Ser. No. 203,838
Claims priority, application Japan, Nov. 26, 1979, 54-152697
Int. Cl.³ H01L *41/00*
U.S. Cl. 310—320 **3 Claims**



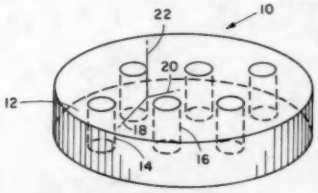
1. An ultrasonic holography imaging device comprising; a transducer having a macromolecular piezoelectric sheet with a thickness in the range of 3 μm to 1000 μm; a high frequency signal sweeping device for applying an oscillation high frequency signal to said transducer while changing its frequency sequentially continuously or stepwise, wherein a plurality of high frequencies in the range of from 0.3 f_0 to 0.9 f_0 or 1.1 f_0 to 1.7 f_0 are inputted to said transducer by said high frequency signal sweeping device, where; l is the thickness of a piezoelectric sheet, v is an acoustic velocity in said piezoelectric sheet, and f_0 is a fundamental resonance frequency expressed by v/2l.

4,412,148

PZT COMPOSITE AND A FABRICATION METHOD THEREOF

Kenneth A. Klicker, Whitehall; Robert E. Newnham, State College; Leslie E. Cross, State College, and James V. Biggers, State College, all of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 24, 1981, Ser. No. 257,289
Int. Cl.³ H01L *41/08*
U.S. Cl. 310—358 **4 Claims**



1. A PZT-polymer composite material of 3–1 connectivity which comprises:

a matrix of a polymer;

a plurality of PZT rods embedded in said matrix of the polymer each member of said plurality of PZT rods having the longitudinal axis thereof aligned in the same direction; and

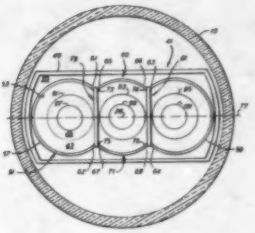
means for electrically poling said PZT material with poling field parallel to the direction of the axes of said plurality of PZT rods.

4,412,149

CRT FOCUSING ELECTRODE STRUCTURE

Donald L. Say, Waterloo, N.Y., assignor to North American Philips Consumer Electronics Corp., New York, N.Y.

Filed Sep. 21, 1981, Ser. No. 303,751
Int. Cl.³ H01J *29/50*
U.S. Cl. 313—414 **5 Claims**



1. An improved beam focusing structure in a color CRT plural beam in-line electron gun assembly embodying a center and two side-related integrated gun structures from which said beams emanate on respective axes in a common in-line plane, said gun assembly being a construction of sequentially positioned in-line electrodes including a forwardly positioned main focusing electrode having rear and forward apertured ends and an adjacent terminally-related plural-apertured final accelerating electrode; said improved structure comprising means for beneficially modifying the lensing fields associated with the main focusing of each of the respective electron beams, said means comprising:

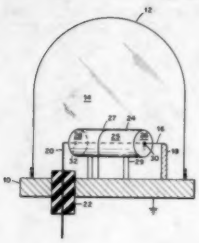
a common elongated perimetrically configurated aperture formed in the forward portion of said main focusing electrode to provide three adjacently overlapping in-line non-symmetrical focusing lenses thereat associated with the respective in-line beams, said perimetrically configurated aperture being formed of peripherally in-turned projections extending substantially normal to the interior surface of said forward end, said configurated aperture being delineated by circular end portions each having termini merging with those of opposed side-related arc portions to produce a pair of equi-spaced opposing cusps pointing toward said in-line plane on either side of said configurated aperture, thereby forming three apertural regions of said common elongated aperture, said arcuate side and circular end portions being delineated substantially from the respective beam axes by substantially similar radii of values greater than the radii of the related individual apertures in said adjacent accelerating electrode;

said means further comprising two like planar wall elements oriented in equi-spaced parallel position on either side of said center axis in a manner to effect jointure with opposed cusps of said aperture, each of said wall elements having a defined length extending into said focusing electrode and a width greater than the diameter of a single aperture in said adjacent accelerating electrode, said wall width being sufficient to bridge said opposed cusps but less than the diameter of a single apertural region of said common configurated aperture, with the forward edge thereof being a concave arcuate formation.

4,412,150
MASER

Igor Alexeff, 2709 Turnpike, Oak Ridge, Tenn. 37830

Filed Nov. 12, 1980, Ser. No. 205,992
Int. Cl.³ H01J 25/00
U.S. Cl. 315—4 15 Claims



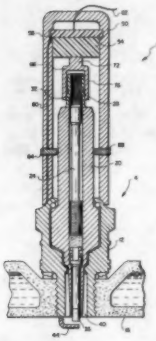
1. A system for generating microwave radiation comprising:
a cathode comprising parallel side wall means;
a first end wall;
a second end wall spaced apart from and opposed to said first end wall;
a first aperture defined in said first end wall and an opposed second aperture defined in said second end wall;
said side wall means, first and second end walls cooperatively defining a space;
an elongated anode extending across said space and outwardly through each of said first and second apertures;
means for generating free electrons adjacent to said anode;
means for applying a potential between said cathode and said anode with said anode having a positive voltage relative to said cathode for electrostatically trapping said free electrons in a surrounding relation with said anode to electrostatically produce a phase bunching in orbit of the electrons and to emit microwave radiation from the chamber defined by said cathode; and
said cathode forming a cavity for containing microwaves to interact with the electrons surrounding said anode.

9. A method of producing microwave radiation comprising:
enclosing an anode and a cathode within a sealed container, said cathode comprising parallel side wall means, a first end wall and a second end wall spaced apart from and opposed to said first end wall, said first end wall defining a first aperture and said second end wall defining an opposing second aperture, said anode comprising an elongated wire means extending across a space, defined by said side wall means and said first end wall and said second end wall, and outwardly through said first aperture and said second aperture;
applying a potential of at least about 500 V between said cathode and said anode;
developing an ion plasma within said space of said cathode and surrounding said anode;
electrostatically trapping electrons contained in said plasma in orbit around said anode;
phase bunching in orbit of the electrons to produce microwave radiation; and
containing microwave radiation within said side wall means and said first and second end walls for interacting with electrons orbiting the anode.

4,412,151
PIEZOELECTRIC CRYSTAL SPARK PLUG

Elwood G. Norris, Salt Lake City, Utah, assignor to Charles W. Taggart, Salt Lake City, Utah

Filed Sep. 2, 1980, Ser. No. 183,253
Int. Cl.³ H01J 7/44, 17/34, 19/78, 29/96
U.S. Cl. 315—55 10 Claims

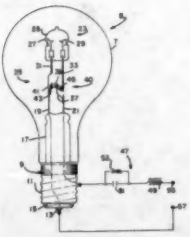


1. A piezoelectric crystal spark plug assembly comprising
an electrically conducting body,
a first electrode mounted in said body and electrically insulated therefrom,
a second electrode disposed near but spaced from one end of the first electrode and electrically coupled to the body,
a first piezoelectric crystal, one side of which is electrically coupled to the other end of said first electrode, and
means responsive to a low voltage electrical signal for mechanically deforming said crystal to cause it to produce and apply an electrical signal to said first electrode to thereby produce a spark between said first and second electrode, said means comprising a plurality of individual piezoelectric crystals structurally coupled together, a first side of each of said individual crystals being connected electrically to said low voltage signal, and a second side of said individual crystals being connected electrically to said body.

4,412,152
DISCHARGE LAMP WITH BIMETAL STARTER

Nikolaos Barakitis, Haverhill, and Sheppard Cohen, Danvers, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jul. 19, 1982, Ser. No. 398,723
Int. Cl.³ H05B 41/06
U.S. Cl. 315—73 12 Claims



1. A high intensity discharge lamp comprising:
a first heremetically sealed envelope having first and second electrically conductive support wires sealed therein and passing therethrough;

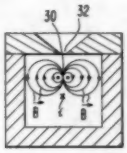
a hermetically sealed arc tube disposed within said first envelope and having first and second electrical leads sealed therein and passing therethrough with said first electrical lead connected to said first support wire; and

a starter device disposed within said first envelope and including a normally-closed switch having first and second contacts, a first bimetal coupling said first contact to said second support wire, an electrical connector coupling said first contact to said second electrical lead, and a second bimetal coupling said second contact to said first support wire.

4,412,153
DUAL FILAMENT ION SOURCE

Charles R. Kalbfus, Stromville, N.Y., and Norman L. Turner, Gloucester, Mass., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 126,225, Mar. 3, 1980, abandoned. This application Aug. 14, 1981, Ser. No. 293,026
Int. Cl.³ H01J 7/24
U.S. Cl. 315—111.81 **6 Claims**



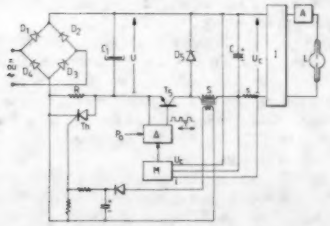
1. An electron-bombardment ion source having an electrode mounted within an ionization chamber, a power supply to provide electrical current to said electrode to heat it resistively to produce thermionic emission of electrons, an external magnet for superimposing a magnetic field on the interior of the ionization chamber, means for providing ionizable material to said ionization chamber, and an ion extraction aperture formed in a wall of said ionization chamber, the improvement comprising:

the electrode is composed of two parallel segments mounted symmetrically inside said ionization chamber along opposing edges of said extraction aperture and oriented with parallel axes aligned with said magnetic field.

4,412,154
START UP FREQUENCY ADJUSTMENT IN AN ELECTRONIC POWER DEVICE FOR A DISCHARGE LAMP

Denys C. Klein, Orsay, France, assignor to Compagnie de Signaux et d'Entreprises Electriques, Paris, France

Filed Jun. 25, 1981, Ser. No. 277,392
Claims priority, application France, May 20, 1981, 81 10056
Int. Cl.³ H05B 41/36
U.S. Cl. 315—224 **5 Claims**



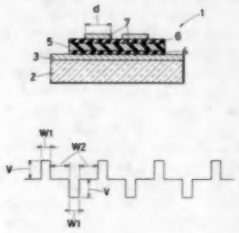
1. An electronic power supply device for a discharge lamp including a switching regulator formed by a chopper transistor driven with a variable cyclic ratio through a driver stage, a smoothing inductance, a freewheel diode and a smoothing capacitor, further comprising:

means for lowering the switching frequency of the chopper transistor during the heating-up period of the lamp until its striking voltage has reached about 70% of its rated value.

4,412,155
AGING METHOD FOR THIN-FILM ELECTROLUMINESCENT DISPLAY ELEMENT

Kinichi Isaka, Tenri; Masashi Kawaguchi, Nara, and Hisashi Uede, Wakayama, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Jun. 18, 1981, Ser. No. 274,741
Claims priority, application Japan, Jun. 23, 1980, 55-85705
Int. Cl.³ H05B 33/10
U.S. Cl. 315—246 **8 Claims**



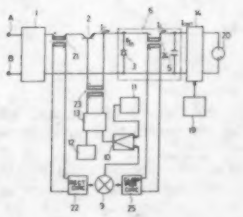
7. An aging method for a thin-film electroluminescent display element comprising the steps of:

applying an AC voltage to electrode means of the element, the frequency of the AC voltage being approximately 500 Hz through 10 KHz, the pulse width of the AC voltage being approximately 20 μsec through 100 μsec, and the magnitude of the AC voltage being approximately the voltage at which a virgin thin-film electroluminescent display element starts to emit electroluminescence plus 30 V to 60 V.

4,412,156
POWER SUPPLY FOR AN AC DISCHARGE LAMP

Masataka Ota, Okazaki, Japan, assignor to Elmo Company, Limited, Nagoya, Japan

Filed Aug. 18, 1981, Ser. No. 294,048
Claims priority, application Japan, Sep. 3, 1980, 55-122592
Int. Cl.³ G05F 1/00
U.S. Cl. 315—308 **3 Claims**



1. A power supply adapted for use with an ac discharge lamp, comprising:

a dc power circuit for generating dc power,

a switching transistor for turning on and off the dc power from said dc power circuit,

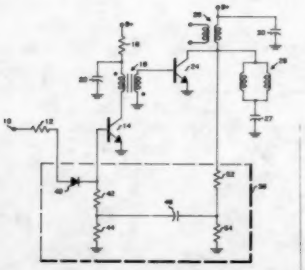
a low pass filter for receiving the dc power from said switching transistor and for supplying smoothed dc power,
a commutator circuit for supplying the dc power from said low pass filter with alternating polarity to said ac discharge lamp,
a commutator control circuit for controlling said cummutator circuit,
a first transformer connected in series between said dc power circuit and said switching transistor, and adapted for sensing the current of the dc power,
a second transformer connected in series between said switching transistor and said commutator circuit, and adapted for sensing the output voltage from said switching transistor,
a rectifier circuit for rectifying the current sensed by said first transformer,
a clamper circuit for applying dc voltage to the voltage sensed by said second transformer,
a summing circuit for summing both of the output voltages from said rectifier circuit and said clamper circuit,
an error detector circuit for comparing the output voltage from said summing circuit with a reference voltage from a reference voltage generating circuit in conjunction with said error detector circuit, and for producing an error signal indicative of the voltage difference therebetween,
a voltage-pulse width converter for receiving a constant frequency pulse signal produced from an oscillator in conjunction with said converter, and altering the pulse width of the pulse signal in response to the error signal from said error detector circuit, and
a third transformer for supplying the output signal from said voltage-pulse width converter to the input terminal of said switching transistor.

4,412,157

PROTECTION CIRCUIT FOR A HORIZONTAL SCANNING CIRCUIT AND CRT

Paul Gamboa, St. Charles, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 2, 1982, Ser. No. 344,918
Int. Cl.³ H01J *29/70, 29/72*
U.S. Cl. 315—387 **4 Claims**



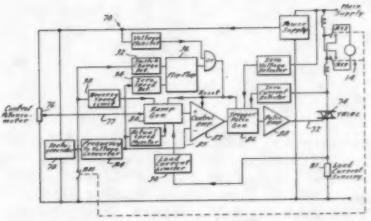
1. A horizontal scanning circuit having the capability of self-oscillation at a first predetermined frequency for a CRT device comprising:
input means for providing horizontal deflection drive signals at a second predetermined frequency, the second frequency being higher than the first predetermined frequency;
yoke means for providing horizontal deflection of the electron beam in the CRT;
horizontal output transistor means coupled to supply signals to the yoke means;
driver means coupled to the input means and to the horizontal output transistor means for preventing conduction in the transistor means and preventing oscillation in the circuit when the driver means is conducting; and
feedback means for coupling the yoke supply signals to control the driver means for allowing self-oscillation in the circuit only while energy is stored in the circuit elements and the drive signals are interrupted.

4,412,158

SPEED CONTROL CIRCUIT FOR AN ELECTRIC POWER TOOL

Keith A. Jefferson, Windsor, and Derek A. Lansdell, Slough, both of England, assignors to Black & Decker Inc., Newark, Del.

Filed Feb. 19, 1981, Ser. No. 236,040
Claims priority, application United Kingdom, Feb. 21, 1980, 8005840
Int. Cl.³ H02P *1/22*
U.S. Cl. 318—257 **2 Claims**

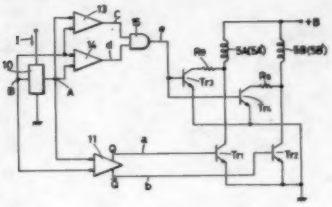


1. An electric power tool, comprising:
an electric motor for driving an output spindle having connected thereto means for receiving a tool implement;
said motor having its commutator brushes slightly shifted from the neutral position to provide for better commutation in the forward direction of rotation;
switch means operable between forward and reverse positions for changing the direction of rotation of said motor from a forward direction to a reverse direction and vice versa by controlling the polarity of the power applied to said motor;
control circuit means for controlling the speed of rotation of said motor in both rotational directions by controlling the magnitude of the power applied to said motor, said control circuit means comprising a potentiometer, a ramp generator, reverse speed limiting means, a zero speed detector, a switch change detector, and a flip-flop;
said potentiometer being adjusted to provide a set speed signal to the ramp generator to determine the power applied to the motor;
said reverse speed limiting means being rendered operative when said switch means is in the reverse position to limit the ramp height attainable by said ramp generator to limit the maximum speed of the motor in said reverse direction to below that attainable in said forward direction to keep problems in the reverse direction due to poor commutation to an acceptable level;
said switch change detector actuating said flip-flop each time said switch means is actuated to disable the ramp generator and cut off supply of power to the motor; and
said zero speed detector actuating said flip-flop to remove its disabling effect and re-establish the supply of power to the motor when the motor speed has dropped to zero.

4,412,159
DRIVE CIRCUIT FOR AN ALTERNATE PHASE BRUSHLESS DC MOTOR

Mitsuo Uzuka, Urawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 2, 1981, Ser. No. 239,439
Claims priority, application Japan, Feb. 29, 1980, 55-25798
Int. Cl.³ H02P 7/06
U.S. Cl. 318—254 24 Claims



1. A drive circuit for an alternate phase brushless DC motor having at least first and second stator coils of alternate phase and a rotor including rotor magnets, the stator coils and the rotor magnets having a rotational torque relationship such that the rotational torque for each coil extends over an electrical angle of more than 180° and has gradual rising and falling portions having points of intersection with falling and rising portions, respectively, of the rotational torque of the other coil, the drive circuit comprising:

sensing means for sensing the rotational position of said rotor magnets;

and switching means for alternately energizing said first and second stator coils in dependence on the rotational position of said rotor magnets as determined by said sensing means so that such energization occurs substantially between said points of intersection, wherein said switching means includes a first pair of switching elements for alternately energizing said first and second stator coils for respective electrical angles of 180° commencing and ending substantially at successive points of intersection so that simultaneous energization of said coils by said first pair of switching elements is substantially avoided; and

correcting means comprising a second pair of switching elements coupled to said stator coils for energizing by predetermined amounts said first and second stator coils, respectively, prior to and following said points of intersection to provide a predetermined period of simultaneous energization of said stator coils at said points of intersection and thereby minimize torque ripple.

4,412,160
DC MOTOR DRIVING APPARATUS

Akira Kojima, Toki, and Toshiyasu Sakai, Kariya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Oct. 14, 1981, Ser. No. 311,401
Claims priority, application Japan, Oct. 16, 1980, 55/144627
Int. Cl.³ H02K 23/66
U.S. Cl. 318—280 2 Claims

1. A dc motor driving apparatus comprising:

a full-wave rectifier bridge circuit comprising thyristors for converting ac power to dc power;

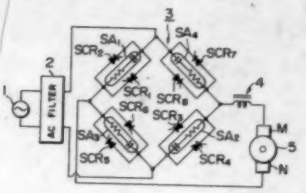
a dc motor forward rotation control signal supply circuit;

a dc motor backward rotation control signal supply circuit;

a dc motor driving control circuit, responsive to said forward and backward control signal supply circuits, for controlling said thyristors; and

a protecting control circuit operatively associated with said dc motor driving control circuit for preventing the occurrence of a short-circuit mode in said bridge circuit caused by a malfunction of said thyristors and enabling stable driving control of said dc motor, said protecting control circuit comprising:

a first and a second comparator respectively supplied with a dc motor forward rotation control signal from said supply circuit thereof and a dc motor backward rotation control signal from said supply circuit thereof, each thereof generating an output signal when the level of said signal supplied thereto is higher than a predetermined reference voltage, and

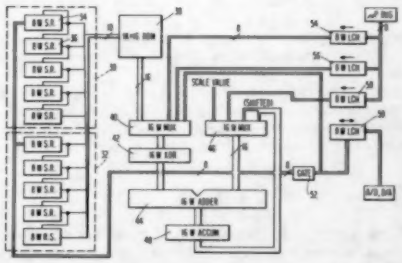


a first and a second inhibit circuit each thereof supplied with the output signals of said comparators and respectively responsive to a signal indicative of a positive half cycle of an ac supply voltage and a signal indicative of a negative half cycle of the ac supply voltage, each thereof generating an output signal for disabling either one of said dc motor forward rotation control signal supply circuit and said dc motor backward rotation control signal supply circuit.

4,412,161
DIGITAL CONTROL OF SERVO CIRCUIT

David T. Cornaby, Roy, Utah, assignor to Iomega Corporation, Ogden, Utah

Filed Apr. 24, 1981, Ser. No. 257,489
Int. Cl.³ G05B 13/00
U.S. Cl. 318—561 5 Claims

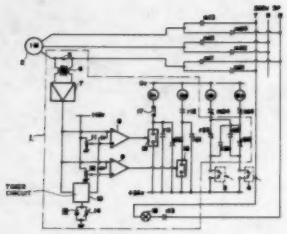


1. Servo apparatus comprising means for compariag a detected position signal to a command position signal, means for updating said command signal based on the result of said comparison means for recursive summation of plural previous command signals and previous detected position signals to yield a next command signal, memory means for storing coefficients, and means for weighting said previous command and-/or detected position signals in said summing step in accordance with said coefficients stored in said memory means.

4,412,162
PROTECTIVE SYSTEM FOR AUTOMATIC TOOL CHANGING APPARATUS

Koichiro Kitamura, Takaoka, Japan, assignor to Kitamura Machinery Co., Ltd., Takaoka, Japan

Filed Feb. 12, 1982, Ser. No. 348,306
Claims priority, application Japan, Feb. 26, 1981, 56-26127
Int. Cl.³ G05B *9/02*
U.S. Cl. 318—563 **4 Claims**



1. A protective system for automatic tool changing apparatus which provides protection against an interference between a tool and a work during the tool changing operation by an automatic tool changing apparatus for a machine tool which performes through a driving electric motor a series of tool changing cyclic operations including lowering and raising of a tool magazine, etc., between a socket of a machining head spindle and the tool magazine, said protective system comprising:

a current detecting circuit for detecting a load current of said driving motor;

a first comparator circuit for generating an output when said current detecting circuit detects a current which is greater than a warning current value preset to a current level greater than a maximum steady-state load current value of said motor;

a second comparator circuit for generating an output when said current detecting circuit detects a current which is greater than an irregularity protection current value preset to a second current level higher than said first current level;

a timer circuit for preventing a detection output of said current detecting circuit from being applied to said comparator circuits for a predetermined time interval during a starting period between the starting of said motor and a time that said load current is stabilized at a steady-state value;

warning relay means operable in response to an output of said first comparator circuit to give an overload warning; and

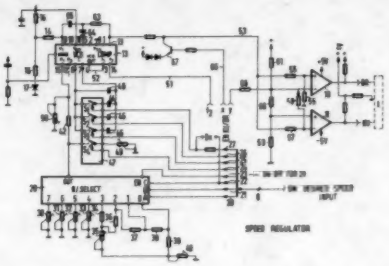
protective action relay means operable in response to an output of said second comparator circuit and an actuation signal from said warning relay means to reverse the direction of rotation of said driving motor thereupon.

4,412,163
POSITIONING DRIVE

Wolfgang Angersbach, Darmstadt, and Peter Schüler, Obertshausen, both of Fed. Rep. of Germany, assignors to Quick-Rotan Elektromotoren GmbH, Darmstadt, Fed. Rep. of Germany

Filed Sep. 16, 1980, Ser. No. 187,971
Claims priority, application Fed. Rep. of Germany, Sep. 20, 1979, 2938040; Mar. 26, 1980, 3011587
Int. Cl.³ G05B *19/00*
U.S. Cl. 318—567 **19 Claims**

1. Positioning drive for a sewing machine having a variable speed coupling motor and means coupled to said motor for performing different sewing functions such as needle positioning, thread cutting, feed adjustment and the like, comprising an at least 8-bit microprocessor system provided with input connections which are connectable to a program data source, and output connections to said motor and to said functional means to control the sewing machine by controlling the rotary speed and/or angular position of the motor, and to control the operation of said functional means according to said program data

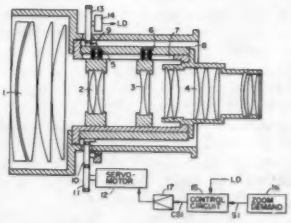


source, and further comprising an actual-speed-value transmitter, the speed-dependent time unit of the actual-speed-value transmitter being comparable by means of the microprocessor with the internal time increment of the microprocessor system, and by a function being triggerable only after a predetermined reference value has been attained.

4,412,164
LENS SYSTEM DRIVING DEVICE

Takashi Ohnuma, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 82,534, Oct. 9, 1979, abandoned. This application Sep. 29, 1982, Ser. No. 428,270
Claims priority, application Japan, Oct. 11, 1978, 53-124134
Int. Cl.³ G05B *11/18*
U.S. Cl. 318—596 **2 Claims**



1. A lens driving device for moving at least one movable lens of a lens system up to an end of a path of movement by a servo-motor, comprising:

a mechanism for moving said at least one movable lens;

a servo-motor operatively connected to said mechanism to move said at least one movable lens;

a speed demand signal generator for generating a direct current voltage signal corresponding to a demanded moving speed and a demanded moving direction;

position detection means for generating a position detection signal corresponding to the position of said at least one movable lens;

a comparator for comparing the output of said position detecting means with a fixed signal representing the end of the path of movement and for generating a signal representing the difference therebetween; and

switching means for supplying the direct current signal of said speed demand signal generator to said servo-motor

until said at least one movable lens reaches a predetermined position adjacent but before the said end, and for supplying the output of said comparator to said servomotor after said at least one movable lens has reached the predetermined position so that said at least one movable lens approaches and reaches the end without any influence from said speed demand signal generator.

4,412,165

SAMPLED SERVO POSITION CONTROL SYSTEM

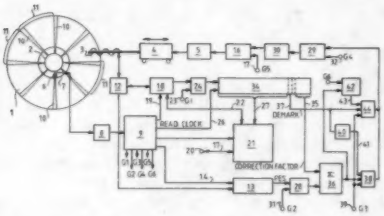
William J. Case, Winchester, and Christopher N. Wallis, Eastleigh, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 21, 1981, Ser. No. 304,433

Claims priority, application European Pat. Off., Oct. 29, 1980, 80303849

Int. Cl.³ G05B 21/02

U.S. Cl. 318—636 **3 Claims**



1. A method of utilizing recorded information on a record medium,

said information being capable of being used by servo controlled apparatus to control a transducer sampling said information to follow a path determined by the recorded information,

said method comprising

causinga servo read/write head to follow the desired track and to sample the recorded items of servo information,

generating for each sampled item of servo information a position error signal indicating mis-alignment between the portion of the desired track and the actual path defined by the recorded servo information,

recording on the medium each generated position error signal indicating mis-alignment between the portion of the desired tracks and the actual path at a location available to be read in advance of the sampling of the associated servo information item,

determining the average value of the position error signals derived by sampling the servo information items around the track and indicating mis-alignment between the desired track and the actual servo paths,

subtracting the average position error signal value from each individual position error-signal, and

storing in digital form each remaining position error signal component at a location along the track available to be read in advance of the sampling of the servo information associated therewith.

4,412,166

STEPPER MOTOR DRIVE CIRCUIT FOR SYNCHRONOUS SWITCHING OF CORE WINDING

Chester H. Crider, and Charles R. Linton, both of Austin, Tex., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 26, 1981, Ser. No. 238,399

Int. Cl.³ G05B 19/40

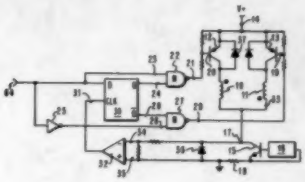
U.S. Cl. 318—696 **11 Claims**

1. A stepper motor drive circuit for controlling current flow from a power source through a stepper motor comprising:

a current path from said source through said motor including at least one winding about a core, said path having two branches,

a first switching device in the first of said branches switchable to conduction or non-conduction through said branch,

a second switching device in the second of said branches switchable to conduction or to non-conduction through said branch,



sensing means operative during the switching of said switching devices to sense the non-conduction of current through the branch being turned off,

and means responsive to said sensing means to switch the switching device in the branch being turned on to then conduct current through said branch.

4,412,167

POLYPHASE POWER FACTOR CONTROLLER

Dan Green, Cranford, N.J., and Sandor Goldner, Brooklyn, N.Y., assignors to Cynex Manufacturing Corporation, Hillside, N.J.

Continuation-in-part of Ser. No. 166,046, Jul. 7, 1980. This application Mar. 30, 1981, Ser. No. 248,990

Int. Cl.³ H02P 5/40

U.S. Cl. 318—729 **7 Claims**

1. A power factor controller for an AC induction motor, comprising:

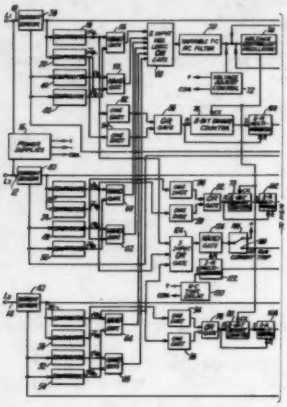
a control means adapted to be electrically connected in series with the motor for controlling the voltage applied to the motor;

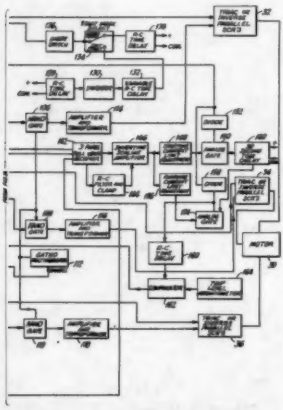
sensing means for providing a phase lag signal corresponding to the difference in phase between the current through the motor and the voltage across the motor;

oscillation means for producing a cyclical output whose frequency is variable and is dependent on the value of said phase lag signal; and

counter means receiving said cyclical output and for producing a control signal corresponding to a predetermined cycle count of said cyclical output, whereby the duration of said control signal is dependent upon said phase difference,

said control signal being applied to said control means for controlling the conduction angle of the voltage applied to





the motor to thereby provide power to the motor in accordance with motor landing.

4,412,168

BATTERY CHARGING AND INDICATING CIRCUIT

Michael R. Sell, Denton, Md., assignor to Black & Decker, Inc., Newark, Del.

Filed Jul. 10, 1981, Ser. No. 282,058
Int. Cl.³ H02J 7/02
U.S. Cl. 320—48 **3 Claims**

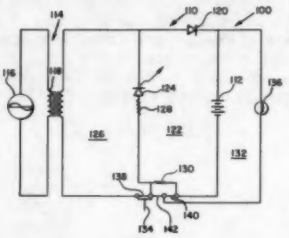
1. A circuit for selectively charging a flashlight battery, indicating the charging process, and operating a flashlight from said battery, said circuit comprising:

a battery charging and indicating circuit portion for providing DC charging current from an AC line current source having alternating half cycle voltage and current, said circuit portion comprising

a step down transformer having a primary and a secondary, the primary being electrically connected to said AC line current source whereby the transformer is adapted to reduce the voltage of said AC line current source,

a charging loop, electrically connected to the secondary of said transformer and comprising a battery and a rectifier, adapted to conduct only those alternate half cycles of said reduced voltage AC line current source comprising charging current for said battery, and

a separate indicating loop, electrically connected to the secondary of said transformer, comprising first discrete current limiting means and combined rectifying and signalling means, said combined rectifying and signal-



ling means being biased to conduct only those half cycles of reduced voltage AC line current source not conducted by said battery charging loop rectifier and emitting a signal when it conducts;

a flashlight operating circuit portion comprising a lamp positioned in series with said battery; and

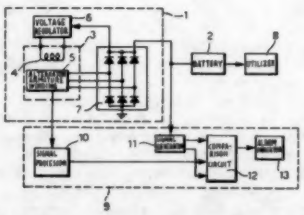
switch means for selectively closing said battery charging and indicating circuit portion and said flashlight operating circuit portion.

4,412,169

CIRCUIT FOR DETECTING AND INDICATING FAULTS AND OPERATING ANOMALIES IN A SYSTEM FOR RECHARGING ELECTRIC ACCUMULATORS

Giuseppe Dell'Orto, Milan, Italy, assignor to Marelli Autronica S.p.A., Milan, Italy

Filed Nov. 25, 1981, Ser. No. 324,938
Int. Cl.³ H02J 7/00
U.S. Cl. 320—64 **20 Claims**



1. In a system for recharging electric accumulators, including a three-phase alternator with a three-phase armature winding and a field winding, a rectifier circuit connected to said alternator, and a voltage regulator circuit connected to said rectifier circuit and said alternator field winding,

a circuit for detecting and indicating faults and operating anomalies, comprising:

a signal processor circuit connected to said alternator armature winding and operable to provide an output test signal substantially proportional to the mean signal value present, in operation, at a real or virtual star point of the phases of said armature winding;

generator means operable to provide first and second predetermined stabilised reference output signals representing, respectively, a minimum and a maximum acceptable value

of said test signal and which are substantially independent of the voltage appearing at said rectifier circuit output;

a comparison circuit connected to said signal processor circuit and said generator means, and operable to provide an output control signal when said test signal falls below said first reference signal, and when said test signal exceeds said second reference signal and,

indicator means connected to said comparison circuit and operable to provide an alarm indication when it receives said control signal.

4,412,170

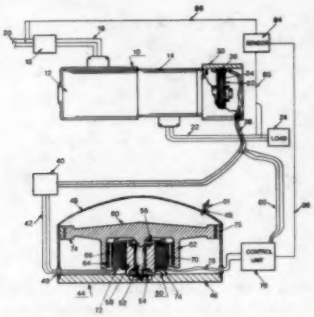
MOTOR-GENERATOR SYSTEM PROVIDING PROLONGED UNINTERRUPTED POWER SUPPLY TO A LOAD

John F. Roesel, Jr., Bradenton, Fla., assignor to Precise Power Corporation, Bradenton, Fla.

Filed Jul. 2, 1981, Ser. No. 279,880

Int. Cl.³ H02P *9/42;* **H02K** *16/00, 47/04, 21/00*

U.S. Cl. 322—4 **8 Claims**



1. In a generator system connected to and cooperating with an external A.C. power source which is subject to faults, failures and outages, in order to supply A.C. power of a substantially constant frequency and voltage to a load without interruptions and including prolonged periods when electrical power from the external A.C. source fails, in combination:

(a) a rotatable generator system connectable to the external A.C. power source, comprising (1) a main A.C. generator which can generate and supply to the load a main A.C. potential at a selected substantially constant frequency and voltage while the main A.C. generator is rotating in a given RPM range and (2) an auxiliary high frequency A.C. generator rotatably connected to the main A.C. generator, the auxiliary A.C. generator capable of functioning as a synchronous motor when supplied high frequency A.C. potential from an outside source, and

(b) the auxiliary generator being electrically connected to a high speed motor and flywheel unit in a sealed chamber to supply the high frequency A.C. to the high speed motor to cause it to rotate at a high speed whereby the motor and flywheel unit can store large amounts of rotational kinetic energy at full speed, a low windage-loss atmosphere being present in the sealed chamber, the high speed motor comprising a motor having a field core of soft magnetic material with a circular cylindrical surface having a layer of magnetizable permanent magnet material thereon, and a slotted stator armature of soft magnetic material having a cylindrical surface complementary to and juxtaposed with the layer of magnet material on the field core, an excitation coil in slots in the armature whereby when A.C. current of a selected frequency is passed through the excitation coil it will induce in the juxtaposed layer of permanent magnet material in the rotating field core a pattern of north and south magnetic poles, and power windings in other slots in the stator armature, the power windings being connected to the auxiliary A.C. generator to receive the high frequency A.C. potential therefrom to cause the high speed motor to operate as hysteresis motor, and upon failure of the external electrical A.C. power, the excitation coil can be energized with a selected constant frequency A.C. current to induce the pattern of north and south magnetic poles in the layer of magnetizable permanent magnet material and thereby cause the power windings in the armature to generate high frequency A.C. of a constant frequency as the rotational kinetic energy of the rotor and flywheel cause the rotor and the stator to rotate with respect to each other, and when this last high frequency A.C. is supplied to the auxiliary generator it will be caused to operate as a synchronous motor to drive the main A.C. generator for a prolonged period of time in the given RPM range and thus generate A.C. potential of the selected frequency and voltage to be supplied to the load.

4,412,171

CIRCUIT ARRANGEMENT FOR DAMPING POWER OSCILLATIONS OF SYNCHRONOUS GENERATORS IN NETWORKS

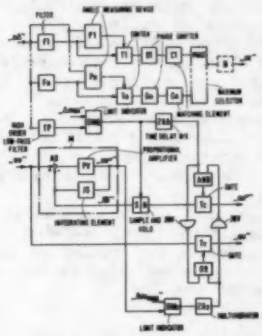
Wolfgang Kaufhold, Erlangen-Tennenlohe, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 10, 1981, Ser. No. 282,149

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1980, 3026360

Int. Cl.³ H02P *9/10*

U.S. Cl. 322—20 **2 Claims**



1. In a circuit arrangement for damping power oscillations of synchronous generators in networks, where discrete filters tuned for the individual oscillator frequency ranges are provided, the output quantities of which are used as supplementary damping signals for regulating the synchronous generators, the improvement comprising:

(a) a plurality of angle measuring devices, one for each filter each angle measuring device having a first input and a second input;

(b) means supplying the respective input signal of the circuit arrangement, corresponding to the frequency or power variation both to the inputs of the individual filters and to the first inputs of angle measuring devices assigned to the latter;

(c) a switching element for each filter;

(d) means connecting the outputs of the filters to the second inputs of the associated angle measuring devices and to said switching elements;

(e) means coupling the outputs of said angle measuring devices to said switches to bring them into circuit dependence on said angle measuring devices;

(f) a common maximum selector element for delivery of a

damping signal to the control device of the synchronous generator;

(g) a phase shifter for each filter; and

(h) a matching element for each filter, the outputs of the respective filter elements coupled through an associated phase shifter and matching element to said common maximum selector.

4,412,172

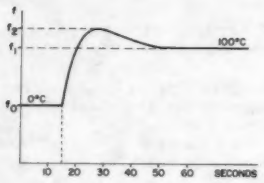
METHOD OF MEASURING THE THERMAL PROPERTIES OF A RESONATOR

John R. Vig, Colts Neck, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Oct. 28, 1981, Ser. No. 315,850

Int. Cl.³ G01R *29/22, 23/00;* H04R *17/00*

U.S. Cl. 324—56 11 Claims



6. Method of rapidly and inexpensively measuring the thermal properties of a crystal resonator that is substantially free of activity dips, said method including the steps of:

(a) immersing the resonator into a constant temperature ice bath at 0° C. and monitoring the frequency versus time characteristic of the resonator at least until the frequency of the resonator is no longer changing,

(b) rapidly immersing the resonator into a constant temperature boiling water bath at 100° C. and monitoring the frequency versus time characteristic of the resonator at least until the frequency of the resonator is no longer changing,

(c) repeating steps (a) and (b) at least once, and

(d) determining the thermal properties of the crystal resonator from the frequency versus time characteristics wherein the water in both baths has a resistivity of greater than 1 megohm centimeter.

4,412,173

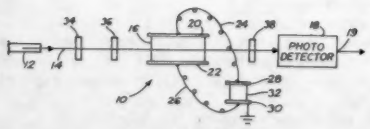
APPARATUS USING LEAKAGE CURRENT FOR MEASURING RESISTIVITY

Gail A. Massey, San Diego, Calif., assignor to The Oregon Graduate Center for Study and Research, Beaverton, Oreg.

Filed Jan. 26, 1981, Ser. No. 228,147

Int. Cl.³ G01R *27/02*

U.S. Cl. 324—62 9 Claims



1. Apparatus for measuring electrical resistivity of a sample comprising

an optically active material, said material being of the type which changes a property of a light beam passing therethrough responsive to changes in an electric field,

a source for transmitting light through said material,

a first pair of conductors between which lies said material,

a second pair of conductors between which lies the sample,

first connecting means electrically connecting one conductor in said first pair to one conductor in said second pair,

second connecting means electrically connecting the other conductor in said first pair to the other conductor in said second pair,

a source for selectively generating voltage between said second pair of conductors, and

a light detector positioned to detect light emerging from said material, said detector being constructed to monitor such property changes of the emerging light.

4,412,174

MONITORING OF CORROSION

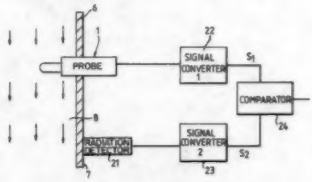
Thomas W. Conlon, Abingdon, and Constantin Edeleanu, Cambridge, both of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed May 27, 1981, Ser. No. 267,656

Claims priority, application United Kingdom, May 30, 1980, 8017670

Int. Cl.³ G01R *27/02*

U.S. Cl. 324—65 CR 8 Claims



1. A method of detection and measurement of pitting corrosion in a corrosive environment, comprising the operations of exposing to the corrosive environment a corrodible element, a surface region of which has been rendered radioactive, measuring changes in a parameter of the element which is susceptible to the effects of corrosion of the element, simultaneously either measuring changes in the activity of the element or the growth of activity at a station downstream of the element, deriving from both sets of measurements indications of the rate of removal of corroded material from the element and comparing the indicated rates of removal of material from the element.

4,412,175

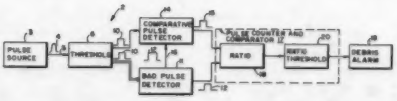
DEBRIS ALARM

Franklin D. Maynarez, Miami, Fla., assignor to Coulter Electronics, Inc., Hialeah, Fla.

Continuation-in-part of Ser. No. 259,717, Apr. 30, 1981. This application Mar. 15, 1982, Ser. No. 357,913

Int. Cl.³ G01N *27/00*

U.S. Cl. 324—71.1 10 Claims



1. An abnormal pulse detector for use with a particle analyzing apparatus for studying particles in suspension, said apparatus including a particle sensing aperture through which said particles in suspension are passed, means for passing an electric current through said aperture simultaneously with passage of a particle through said aperture, and detecting means responsive to impedance variations for generating a discrete particle pulse with the passage of said particle through said aperture, said

abnormal pulse detector comprising: bad pulse detector means for generating a bad pulse signal for each said particle pulse which has an abnormal width; accumulating means for accumulating said bad pulse signals; comparator means for comparing the accumulated bad pulse signals to a predetermined standard representative of an undesirable level of said bad pulse signals; alarm indicator means for indicating that the accumulated bad pulse signals have reached said undesirable level.

4,412,176

TESTING METHOD FOR DETERMINING THE MAGNETIC PROPERTIES OF FERROMAGNETIC POWDERS

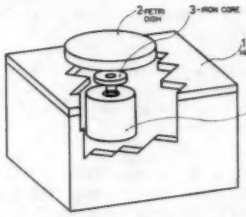
Horst Krämer, and Heinrich Fassbender, both of Hürth, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 17, 1981, Ser. No. 234,986

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1980, 3006626

Int. Cl.³ G01R *33/12*; G01N *27/74*

U.S. Cl. 324—204 **2 Claims**



1. A method permitting ferromagnetic powders to be tested for their qualification for use as heavy media in the float-sink dressing of minerals, which comprises:

(a) magnetizing the ferromagnetic powder in a magnetic steady field at a field strength within the range 600 to 1000 amperes per cm;

(b) demagnetizing the magnetized ferromagnetic powder in a cyclicly decreasing magnetic alternating field at a field strength within the range 1000 to 1500 amperes per cm;

(c) heaping up, in the center portion of a circular plate made from dielectric material, 0.2 to 0.5 g of the ferromagnetic powder pretreated as described under (a) and (b);

(d) placing the circular plate described under (c) on an iron core-provided coil, applying an alternating current voltage of 180 to 260 volts thereto, thereby effecting the occurrence of alternating fields of 180 to 220 amperes per cm in the center portion of the circular plate; and

(e) observing the heaped ferromagnetic powder for the figure it is forming under the influence of the alternating fields according to (d), the formation of a closed figure around the center portion of the plate indicating unlimited qualification of the ferromagnetic powder for use in a heavy medium suspension.

4,412,177

EDDY CURRENT INSPECTION TOOL WHICH IS SELECTIVELY OPERABLE IN A DISCONTINUITY DETECTION MODE AND A DISCONTINUITY MAGNITUDE MODE

Richard R. Petrini, and Dorin F. Van Lue, both of Livermore, Calif., assignors to The United States of America as represented by the U.S. Department of Energy, Washington, D.C.

Filed Oct. 29, 1980, Ser. No. 201,946

Int. Cl.³ G01N *27/90*; G01R *33/12*; G01B *7/14*; G02B *5/17*

U.S. Cl. 324—226 **3 Claims**

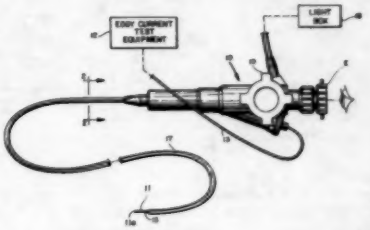
1. An eddy current inspection tool for nondestructive testing and detection of discontinuities in metal objects, said tool comprising:

an eddy current sensing coil;

means for activating said coil with a high-frequency signal whereby said coil is adapted to induce eddy currents in objects positioned within the pulsating magnetic field of said coil;

circuit means responsive to impedance changes produced in said coil by the eddy currents induced in the test object, to produce a voltage output data signal which is proportional to the distance between said coil and the test object; and

audio signalling means, operable in at least two modes and responsive to said voltage output data signal, for audibly signalling the detection of a discontinuity in the test object, which audio signalling means includes a mode select switch which is selectively operable in a first mode to route said voltage output data signal through means responsive to said voltage output data signal for generating a constant single frequency tone indicating detection of a discontinuity in said test object, and which mode select switch is selectively operable in a second mode to route said voltage output data signal through means responsive to said voltage output data signal for generating from a tone generator means a signal tone whose frequency is proportional to the voltage output data signal whereby said signal tone is indicative of the magnitude of the discontinuity in inspection applications or of the degree of displacement of the test object in displacement measurement applications.



4,412,178

COMPUTER-CONTROLLED, PORTABLE PULSED NMR INSTRUMENT AND METHOD OF USE WHEREIN A DC MAGNETIC FIELD GRADIENT IS ARTIFICIALLY INTRODUCED

Robert J. S. Brown, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 15, 1981, Ser. No. 255,975

Int. Cl.³ G01N *27/00*

U.S. Cl. 324—303 **16 Claims**

1. Automatic apparatus for swiftly determining fluid-flow properties of a rock sample based on NMR response of hydrogen nuclei of interstitial fluids within pore spaces of said samples in which DC field inhomogeneity must be artificially introduced in order to increase data-throughput efficiency (DTE) comprising:

(a) magnet means for producing a DC magnetic field acting on said rock sample, said magnetic field having an intensity of at least 1 kilogauss to aid in providing a series of nuclear magnetization build-ups associated with said interstitial fluids within said sample as a function of time;

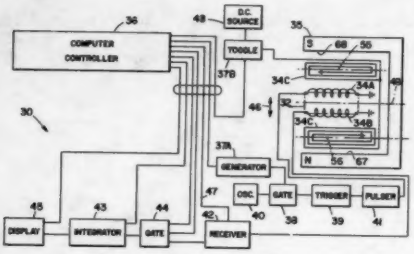
(b) RF coil means acting at right angles to said DC magnetic field;

(c) transmitter means including digital control means for generating a first series of digital control codes associated with a series of RF magnetic pulses of selected frequency, amplitude and duration, connected to said RF coil means to pro-

duce said series of RF magnetic pulses for interrogating said sample;

(d) gradient DC coil means connected to said digital control means for generating a series of DC magnetic gradient fields across said sample as a function of a second series of control pulses so as to artificially introduce a DC field inhomogeneity of D gauss across said sample;

(e) said amplitude of each pulse of (c) being controlled to be at least greater than the variation D in said DC field over of said sample;



(f) receiver means connected to said digital control means and to said RF coil means for generating aided via a third series of digital control codes associated with opening and closing of a plurality of time windows output signals proportional to said nuclear magnetic resonance response of said interstitial fluids;

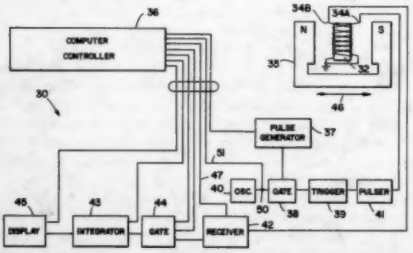
(g) said transmitter means including said digital control means being employed so that said sample can be repetitively interrogated to serially indicate nuclear magnetization relaxation without need for applying rescrambling reversing RF magnetic field pulses prior to the start of each magnetization build-up cycle.

4,412,179

COMPUTER-CONTROLLED, PORTABLE PULSED NMR INSTRUMENT AND METHOD OF USE WHEREIN THE TIMES OF RF INTERROGATION ARE DISTRIBUTED OVER AT LEAST A CYCLE AT THE NUCLEAR MAGNETIZATION PRECESSIONAL FREQUENCY

Robert J. S. Brown, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Apr. 15, 1981, Ser. No. 255,977
Int. Cl.³ G01N *27/00*
U.S. Cl. 324—303 **17 Claims**



1. Automatic apparatus for swiftly determining flid-flow properties of a rock sample based on NMR response of hydrogen nuclei of interstitial fluids within pore spaces of said sample in which phase background jitter must be artificially introduced to increase data-throughput efficiency (DTE) comprising:

(a) magnet means for producing a DC magnetic field acting on said rock sample, said magnetic field having an intensity of at least 1 kilogauss and an inhomogeneity of at least D gauss over said sample to aid in providing a series of nuclear magnetization build-ups associated with said interstitial fluids within said sample as a function of time;

(b) RF coil means acting at right angles to said DC magnetic field;

(c) transmitter means including digital control means for generating a first series of digital control codes associated with a series of RF magnetic pulses of selected frequency, amplitude and duration, connected to said RF coil means to produce said series of RF magnetic pulses for interrogating said sample, said amplitude of each pulse being controlled to be at least greater than the variation D in said DC field over of said sample;

(d) receiver means connected to said digital control means and to said RF coil means for generating (via a second series of digital control codes associated with a plurality of time windows) output signals proportional to said nuclear magnetic resonance response of said interstitial fluids;

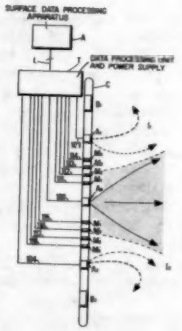
(e) said transmitter means including said digital control means having an artificially provided phasal background jitter characteristic associated wherein the times of RF interrogation are distributed over at least a cycle at the nuclear magnetization precessional frequency, so that said sample can be repetitively interrogated to serially indicate nuclear magnetization relaxation without need for applying rescrambling reversing RF magnetic field pulses prior to the start of each magnetization build-up cycle.

4,412,180

METHOD AND DEVICE WITH ADJUSTABLE FOCUSING FOR MEASURING THE ELECTRIC RESISTIVITY OF GEOLOGICAL FORMATIONS

Robert Desbrandes, Sevres, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Aug. 15, 1980, Ser. No. 178,421
Claims priority, application France, Aug. 17, 1979, 79 21030
Int. Cl.³ G01V *3/24*
U.S. Cl. 324—373 **19 Claims**



1. In a method of measuring the electrical resistivity of geological formations traversed by a borehole, comprising transmitting a main electric current into these formations from a central electrode, and transmitting focusing currents from at least two guard electrodes symmetrically located on opposite sides of the central electrode, with said central and guard electrodes being positioned in the borehole, the improvement comprising the steps of:

(a) separately and independently supplying, from a separate current source, each guard electrode with an electric current to generate an electric potential varying in a predetermined manner between the guard electrodes and the central electrode;

(b) measuring the relative values of the electrical potential of at least two separate points on respective sides of the central electrode, each of said at least two separate points being located between the central electrode and a respective guard electrode, and each of said measuring points being electrically independent from all other measuring points;

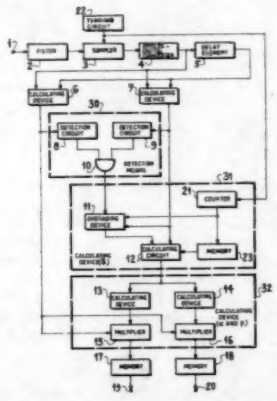
(c) independently adjusting the focusing electric current supplied to each of the guard electrodes, in response to said measured relative potential values of said at least two points between the central electrode and the respective guard electrode to obtain a voltage gradient of a zero value at a pre-selected location on each side of the central electrode to define between said pre-selected locations the geological formation whose electrical resistivity is being measured; and

(d) processing the values of the guard electrode currents and potentials, and the central electrode current and potential, as adjusted, in a predetermined functional manner to obtain the electrical resistivity of said defined geological formation.

4,412,181
PROCESS FOR THE DEMODULATION OF AN AMPLITUDE MODULATED SIGNAL AND DEMODULATOR PERFORMING THIS PROCESS

Andre Marguinaud, and Gerard Sorton, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Mar. 27, 1981, Ser. No. 248,287
Claims priority, application France, Apr. 1, 1980, 80 07297
Int. Cl.³ H04N *5/04*
U.S. Cl. 329—50 **5 Claims**



1. A process for the demodulation of an amplitude modulated signal composed of two suppressed carriers, at a same frequency F and in phase quadrature, which are respectively modulated by two modulation signals, comprising the steps of:

determining polar coordinates (ρ_t, θ_t) of a rotating vector representing the modulated signal, at time t, by calculating:

$$\rho_t = \sqrt{y^2\left(t-\frac{1}{4F}\right)+y^2(t)}$$

$$\theta_t = arctg\ \frac{y(t)}{y\left(t-\frac{1}{4F}\right)}$$

where y(t) and y(t−(1/4F) are values of two successive samples of the modulated signal;

calculating a value γ of the difference between the polar angle θ_t of the rotating vector representing the modulated signal and the polar angle of a rotating vector representing a reference signal at a frequency F;

calculating values α and β of the instantaneous amplitudes of the modulation signals according to the formulas:

$$\alpha = \rho_t \cos\gamma$$

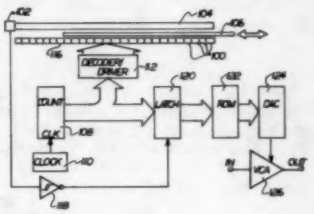
$$\beta = \rho_t \sin\gamma$$

generating two signals whose instantaneous amplitudes are α and β.

4,412,182
APPARATUS FOR CONTROLLING AN OPERATIONAL CHARACTERISTIC OF A CONTROLLED DEVICE IN ACCORDANCE WITH THE POSITION OF A MOVABLE MEMBER

Billy G. Yochum, Quincy, Ill., assignor to Harris Corporation, Melbourne, Fla.

Filed Mar. 9, 1981, Ser. No. 242,019
Int. Cl.³ H03F *17/00*; G01D *5/34*
U.S. Cl. 330—59 **27 Claims**



1. Apparatus comprising:

a movable member;

means for providing a first electrical signal indicating the position of said movable member; and

means responsive to said first electrical signal for providing a second electrical signal representing a value assigned to the position indicated by said first electrical signal, said second electrical signal providing means comprising a solid state memory having said assigned values stored at addressable locations therein, said memory being addressed by said first electrical signal to provide said second electrical signal in accordance with said stored assigned values,

whereby the values assigned to different positions of said movable member may be changed by changing said solid state memory or the values stored therein.

4,412,183
AC RESISTOR ATTENUATOR AND ASSOCIATED AMPLIFIER CIRCUITS

Benjamin T. Brodie, 8209 181st Pl. Edmonds, Wash. 98020

Filed Oct. 6, 1980, Ser. No. 194,137
Int. Cl.³ H03F *1/00*
U.S. Cl. 330—68 **28 Claims**

26. An AC resistor attenuator with low parasitic capacitance coupling to surrounding items and, thus, substantially constant attenuation over a relatively wide frequency range, said AC resistor attenuator comprising:

a first resistor;

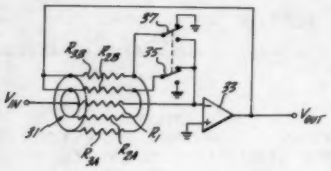
a second resistor substantially entirely surrounding said first resistor for reducing parasitic capacitance coupling to said first resistor;

said first and second resistors being thermally matched and having substantially identical resistance profiles;

electrical connecting means for connecting said first and second resistors in series;

input terminal means connected to one end of said series connected first and second resistors;

output terminal means connected to the junction between said series connected first and second resistors; and



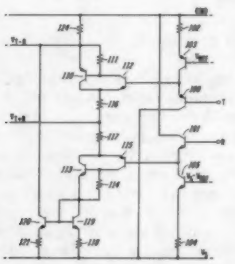
common terminal means connected to the other end of said series connected first and second resistors, wherein said first resistor comprises a first coil of elongate resistive material; said second resistor comprises a second coil of elongate resistive material having a diameter larger than the first coil of elongate resistive material; and said first and second coils of elongate resistive material are coaxially oriented.

4,412,184

PRECISION ISOLATION AMPLIFIER

Milton L. Embree, Reading, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 24, 1981, Ser. No. 295,691
Int. Cl.³ H03F 3/45
U.S. Cl. 330—69 **5 Claims**



1. A precision isolation amplifier circuit having a pair of input terminals (T, R) and an output terminal (V_{T+R}), for producing an output signal on said output terminal (V_{T+R}) representing the average of the input signals (V_T, V_R) appearing on said pair of input terminals (T, R) comprising:

first (**100, 102, 103**) and second (**101, 104, 105**) input means connected respectively to said first (T) and said second (R) input terminal and responsive to a first (V_T) and a second (V_R) voltage signal appearing on said first (T) and said second (R) input terminals respectively for generating a first (V_T+V_{BE100}) and a second (V_R+V_{BE101}) drive signal which respectively comprise said first voltage signal (V_T) plus a first offset signal (V_{BE100}) which is independent of said first voltage signal and said second voltage signal (V_R) plus a second offset signal (V_{BE101}) which is independent of said second voltage signal;

first (**110–112**) and second (**113–115**) up/down emitter follower means connected to said first (**100, 102, 103**) and said second (**101, 104, 105**) input means respectively for generating the inverse of said first offset signal (V_{BE100}) and said second offset signal (V_{BE101}) respectively;

wherein said first (**110–112**) and said second (**113–115**) up/down emitter follower means are responsive to said first (V_T+V_{BE100}) and said second (V_R+V_{BE101}) drive signals respectively for combining said generated inverse first (V_{BE100}) and second (V_{BE101}) offset signals respectively with said first and said second drive signals to output said first (V_T) and said second (V_R) voltage signals respectively; and

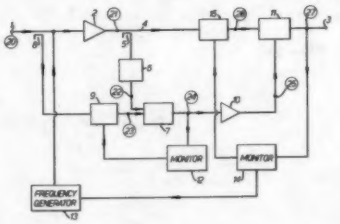
sum means (**116, 117**) connected to both said first (**110–112**) and said second (**113–115**) up/down emitter follower means and responsive to said first (V_T) and said second (V_R) voltage signals output therefrom for generating said output signal on said output terminal (V_{T+R}) representing the average of said first (V_T) and said second (V_R) voltage signals.

4,412,185

FEEDFORWARD AMPLIFIERS

Roger E. J. Gerard, Chelmsford, England, assignor to The Marconi Company Limited, Chelmsford, England

Filed Jun. 16, 1981, Ser. No. 274,214
Claims priority, application United Kingdom, Jul. 4, 1980, 8021928
Int. Cl.³ H03F 1/26
U.S. Cl. 330—149 **12 Claims**



1. A feedforward amplifier including a main amplifying device coupled between an input terminal at which an input signal is received and an output terminal at which an amplified replica of the input signal is provided; comparison means for comparing a signal derived from the output of the main amplifying device with the input signal to produce a difference signal representative of distortions introduced by said main amplifying device; combiner means for combining an amplified difference signal with the output of the main amplifying device to compensate for these distortions; means for injecting a reference signal into the main amplifying device and for monitoring the amplified signal present at said output terminal; and means for adjusting the transfer characteristic of the feedforward amplifier to minimise the amplitude level of said reference signal at said output terminal.

4,412,186

CURRENT MIRROR CIRCUIT

Katsumi Nagano, Hiratsuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 6, 1981, Ser. No. 251,338
Claims priority, application Japan, Apr. 14, 1980, 55-49021
Int. Cl.³ H03F 3/04
U.S. Cl. 330—288 **2 Claims**

1. A current mirror circuit comprising:

a power supply terminal;

an input current source;

an output across a load;

a first stage including:

first, second and third transistors of a first conductivity type, each having a base, a collector and an emitter electrode,

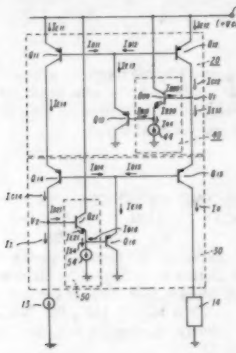
said first and second transistors having their base electrodes connected in common and their emitter electrodes connected to said power supply terminal, and said third transistor having its emitter connected in common with said base electrodes of said first and second transistors and its collector electrode connected to a reference voltage;

a fourth transistor of a second conductivity type, having a base electrode connected to said collector electrode of said second transistor, a collector electrode connected to said power supply terminal, and an emitter electrode connected to the base electrode of said third transistor;

and a current source connected to said emitter electrode of said fourth transistor;

a second stage including:

fifth, sixth and seventh transistors of said first conductivity type, each having a base, a collector and an emitter elec-



trode, said fifth and sixth transistors having their base electrodes connected in common and their emitter electrodes connected to the respective collector electrodes of said first and second transistors, the collector electrode of said fifth transistor being connected to said input current source, and the collector electrode of said sixth transistor being connected to said output, and said seventh transistor having its emitter electrode connected in common with the base electrodes of said fifth and sixth transistors and its collector electrode connected to said reference voltage;

an eighth transistor of said second conductivity type having a base electrode connected to the collector electrode of said fifth transistor, a collector electrode connected to said power supply terminal, and an emitter electrode connected to the base electrode of said seventh transistor; and

a current source connected to the emitter electrode of said seventh transistor.

4,412,187

PHASE ADJUSTABLE HORIZONTAL OSCILLATOR FOR A DATA DISPLAY MONITOR

Donald C. Ryon, Carol Stream, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

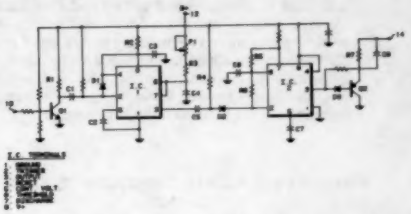
Filed May 4, 1981, Ser. No. 260,518
Int. Cl.³ H03D *1/00*; H03K *9/00*
U.S. Cl. 331—108 D **2 Claims**

1. Horizontal oscillator circuitry as for a CRT data display monitor and comprising:

input means for providing a horizontal synchronizing signal having a range of possible frequencies and including an inverting circuit, a differentiating circuit coupled to the output of the inverting circuit, and means for clipping the differentiated signal to provide a negative going spike in response to each pulse of the received signal;

an adjustable delay circuit coupled to the input means for delaying the received signal over a range of at least one horizontal line period and including a controllable delay means, means for adjusting the delay means, a differentiator coupled to the output of the delay means, and means for clipping the differentiated signal to provide a delayed negative spike in response to each pulse of the received signal;

an oscillator coupled to the delay circuit for being synchronized by the delayed signals and adapted to oscillate at a first predetermined frequency when no signal is being received, said predetermined frequency being higher than the range of possible synchronizing frequencies;



a discharge circuit coupled to the output of the oscillator for providing immediate discharge for a portion of the horizontal output circuitry of the CRT monitor and including means for disenabling the discharge during the positive portions of the oscillator output signals; and

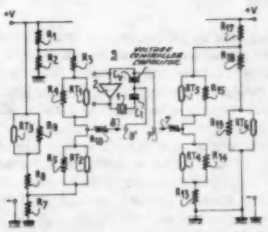
output means for coupling the output signals of the discharge circuit to said portion of the horizontal output circuitry.

4,412,188

TEMPERATURE-COMPENSATED CRYSTAL OSCILLATOR

Jacques Helle, and Guy Caret, both of Sartrouville, France, assignors to Compagnie d'Electronique et de Piezo-Electricite C.E.P.E., Sartrouville, France

Filed Feb. 20, 1981, Ser. No. 236,630
Claims priority, application France, Feb. 22, 1980, 80 03979
Int. Cl.³ H03B *5/36*; H03L *1/02*
U.S. Cl. 331—176 **4 Claims**



1. A crystal oscillator with frequency regulation over a wide temperature range comprising:

an oscillating circuit in the form of an amplifier, an oscillating piezoelectric crystal and a capacitor variable as a function of applied voltage; and

a two-part compensating circuit adapted for connection to the terminals of a d.c. power supply and having first and second output terminals for supplying to said capacitor a compensating signal including:

(1) a main circuit part for supplying a potential to said first output terminal and constituted by first and second elements whose electrical resistance is dependent upon temperature each connected at one end to said first output terminal, and two voltage dividers each con-

nected, respectively, to the other end of one of said first and second elements, one of said dividers including a third element whose electrical resistance is dependent upon temperature and said dividers having respective terminals for connection to a power supply; and

(2) a complementary circuit part for supplying a potential to said second output terminal including a voltage divider constituted by fourth and fifth serially connected elements whose electrical resistance is dependent upon temperature, said elements being connected to said second output terminal and at one end to each other, a first fixed resistor shunting one of said fourth and fifth elements, second and third fixed resistors respectively connected at one end to the other end of said fourth and fifth elements and having a terminal at the other end for connection to respective terminals of said power supply, said compensating signal being the difference between the voltages at said output terminals.

4,412,189

SWITCHABLE SIGNAL COMPRESSOR/SIGNAL EXPANDER

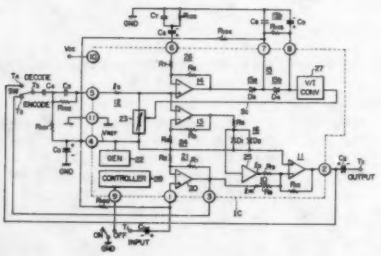
Yasuo Kominami, Kokubunji; Tetsuo Sato, Fussa, and Yuichi Ohkubo, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 12, 1981, Ser. No. 262,814

Claims priority, application Japan, May 19, 1980, 55-65382; May 19, 1980, 55-65384

Int. Cl.³ H04B 1/64

U.S. Cl. 333—14 **13 Claims**



1. A switchable signal compressor/signal expander comprising a combining network and an inverter which are connected in series to form a main path extending between an input terminal and an output terminal; a variable filter and a signal amplifier which are connected in series to form a side path coupled to said combining network; a control amplifier and a rectifier and integrator circuit which are connected in series to control the transfer of said variable filter, an input terminal of said control amplifier being connected to receive the output of said variable filter without passing through said signal amplifier; and a mode switch connected to apply to said side path either the input signal of said combining network or the output signal of said inverter.

4,412,190

APPARATUS FOR PROCESSING CCD OUTPUT SIGNALS

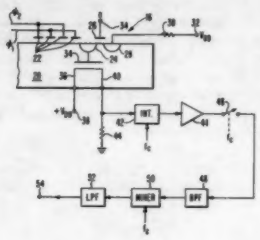
Peter A. Levine, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 5, 1981, Ser. No. 318,350

Int. Cl.³ H03H 17/00, 7/01

U.S. Cl. 333—165 **7 Claims**

1. Apparatus for processing a sampled signal having a sampling frequency and harmonics thereof, a predominantly low frequency relative to the sampling frequency noise component, and a baseband component, said apparatus comprising a sampled integrator having an input means for receiving said sampled signal, a gate coupled to said sampled integrator, filtering means coupled to said gate for band pass filtering said sampled signal about said sampling frequency or a harmonic thereof to produce a filtered signal, and converting means for frequency



converting said filtered signal to a baseband signal; whereby the signal-to-noise ratio of said baseband signal is improved with respect to the signal-to-noise ratio of said baseband component of said sampled signal.

4,412,191

METHOD AND ARRANGEMENT FOR QUANTITATIVE POTENTIAL MEASUREMENTS ON SURFACE-WAVE FILTERS

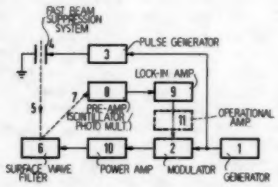
Hans P. Feuerbaum, and Gerald Tobolka, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 27, 1981, Ser. No. 287,133

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1980, 3036713

Int. Cl.³ H03H 9/64, 9/00

U.S. Cl. 333—193 **4 Claims**



1. A method for quantitative potential measurements of a surface-wave filter in which an electron beam measuring device having a scanned and pulsed electron beam makes local measurements at various regions of the surface wave filter by stroboscopically locally sampling in a short time with the pulsed electron beam an overall period of an alternating voltage at the various local regions, and by measuring secondary electron emissions from said various regions which are proportional to the respective alternating voltage at each of said regions, said electron beam measuring device having detection means for providing an alternating current signal proportional to the various secondary electron emissions, wherein the improvement comprises the steps of: providing an alternating driving voltage with an amplitude U_{Ei} connected to an input transducer of the surface-wave filter, an alternating voltage of amplitude U_P arising at each local region to be measured of the surface-wave filter; comparing the secondary electron/alternating current signal with an amplitude I_{AC} created by the stroboscopic local sampling and which arises as a result of pulses of the electron beam at each local region and comparing this signal to a nominal value which is the same for all local region measurements of the filter; and determining a deviation of I_{AC} from the nominal value and controlling the input voltage U_{Ei} driving the surface-wave filter in accordance with said

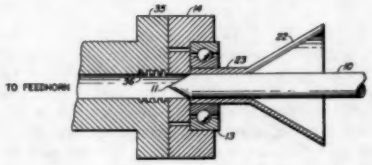
deviation from the nominal value such that the amplitude U_{Ei} is adjusted for each local region being measured to maintain I_{AC} substantially constant whereby amplitudes of the voltage U_{Ei} for the various local regions of the surface wave filter may be utilized to determine surface attenuation of the surface-wave filter and as a function of a frequency of the driving alternating voltage to determine specific characteristics of the filter.

4,412,192

MILLIMETER WAVE DIELECTRIC WAVEGUIDE ROTARY JOINT

Donald D. Paolino, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 14, 1981, Ser. No. 292,777
Int. Cl.³ H01P 1/06
U.S. Cl. 333—257 **16 Claims**



1. An apparatus for use as a waveguide rotary joint in a waveguide system, comprising:

a ball bearing having an inner and an outer race, whose inner race diameter will support the TE_{11}° waveguide mode at a predetermined wavelength;

a flexible dielectric waveguide having the same diameter as said ball bearing's inner face, and having first and second ends, said first end of said dielectric waveguide operably attached to said ball bearing inner race;

means for attaching said ball bearing to said waveguide system;

means for attaching said second end of said dielectric waveguide to said waveguide system.

4,412,193

RESETTABLE CIRCUIT BREAKER FOR USE IN GROUND FAULT CIRCUIT INTERRUPTERS AND THE LIKE

Wolfgang F. Bienwald, Melville, and Herbert W. Tumsuden, Jr., Floral Park, both of N.Y., assignors to Leviton Manufacturing Company, Inc., Little Neck, N.Y.

Filed Sep. 7, 1978, Ser. No. 940,224
Int. Cl.³ H01H 83/02, 73/06
U.S. Cl. 335—18 **5 Claims**

1. In a resettable circuit breaker having at least one pair of normally closed contacts, first means for connecting a load to one of said contacts of said pair, second means for connecting a source of electric current to the other of said contacts of said pair, said second means including means for interrupting the connection between said current source and said other contact in response to a predetermined change in said current, and means for resetting the connection between said current source and said other contact, said resetting means including a movable member having a surface adapted to have applied to it a pressure for movement thereof, the improvement which comprises:

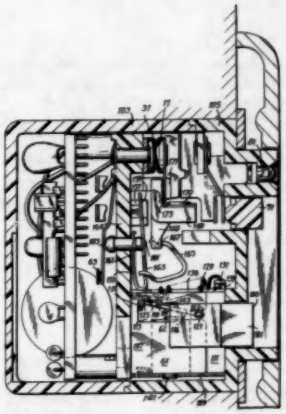
a frame having a planar central member and two spaced parallel side planar members extending transversely from opposite edges of said central member, said side planar members each having a slot, one side of each said slot having first and second laterally displaced edges and a shoulder separating said laterally displaced edges,

a support to which said frame is fixedly mounted,

an armature pivotally connected to said movable member at one end and having spaced from said pivot connection a pair of oppositely extending ears slidably disposed within said respective slots,

a coil spring connected at one end to said armature and at the other end to said frame, the axis of said spring being oblique to the direction of movement of said ears in said slot so that said spring, when tensioned, has one force component urging said ears in a direction parallel to said direction of movement and another force component urging said ears in a direction substantially transverse to said direction of movement and towards said one side of each said slot, the edge of each shoulder adjacent each second edge of each said slot providing a latching point for said ears, said coil spring urging said ears towards said latching point and said second edge when said ears are slid from said first edge to said second edge, said coil spring urging said armature in said direction of movement away from said second edge when said ears are displaced transversely from said second edge beyond said shoulder,

rocker means for supporting a first of said pair of contacts, said rocker means including a rocking member having lip means, a pivot support member fixedly mounted with respect to said base, said pivot support member having



intersecting surfaces adapted to loosely receive said lip means of said rocking member, a second support member fixedly mounted to said base and spaced from said pivot support member having a surface adapted to engage a surface of said rocking member, a spring means in engagement with said rocking member, said base and said armature, said spring means urging said rocking member against said pivot support means and being movable in response to movement of said armature to urge said rocking member to rotate into engagement with said second support member when the ears of said armature are in engagement with the first edges of said slots and to urge said rocking member to rotate away from said second support member when the ears are urged in engagement with the second edges of said slots, one of said pair of contacts being mounted on said rocking member and the other of said pair of contacts being mounted on said base, said contacts being urged into mutual engagement when said rocking member is urged away from said second support member and being urged apart when said rocking member is urged against said second support member, and

an electromagnet mounted on said frame in spaced relationship to said armature and energized in response to said predetermined change in current for transversely displacing said ears from said second edge of said slot to a posi-

tion beyond said shoulder thereby causing said contacts to separate.

4,412,194

CONVERGENCE UNIT FOR IN-LINE COLOR CATHODE RAY TUBE

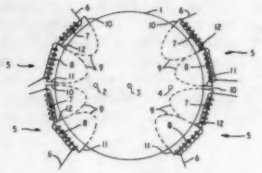
Brian D. Chase, Eastleigh, England, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1982, Ser. No. 454,399

Claims priority, application European Pat. Off., Mar. 31, 1982, 82301684.5

Int. Cl.³ H01F 7/00

U.S. Cl. 335—210 **8 Claims**



1. A convergence unit for an in-line color cathode ray tube comprising a pluraity of E-shaped cores carrying windings and located around the neck of the cathode ray tube for providing magnetic fields for shifting one or both of the outside electron beams to correct for misconvergence at the screen of the cathode ray tube, characterized in that there are four E-shaped cores, two associated with each outside electron beam each E-shaped core being arranged to provide a substantially zero magnetic field at the center electron beam and a net magnetic field at its associated outer electron beam by means of a winding or windings causing its central pole piece to be of opposite magnetic polarity to its end pole pieces.

4,412,195

SUPERCONDUCTING SOLENOID COIL

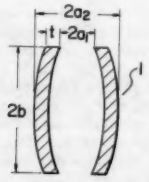
Kunishige Kuroda, Hitachi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 15, 1982, Ser. No. 368,662

Claims priority, application Japan, Apr. 17, 1981, 56-57106

Int. Cl.³ H01F 7/22

U.S. Cl. 335—216 **9 Claims**



1. A superconducting solenoid coil having an inner surface portion of curved configuration in axial section, the radius of said inner surface portion being largest at the middle point of the central axis of said coil and decreasing towards the both ends of said coil, said inner surface portion making point symmetry with respect to a point on said central axis and extending over at least a part of the axial total length of said coil.

4,412,196

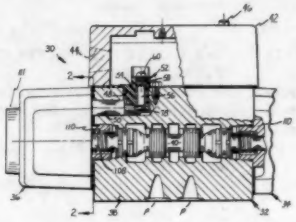
SOLENOID FOR DIRECTIONAL VALVES

Rainer Teichert, Plymouth, Mich., assignor to Double A Products Company, Manchester, Mich.

Filed Apr. 8, 1982, Ser. No. 366,629

Int. Cl.³ H01F 7/10

U.S. Cl. 335—250 **20 Claims**



1. In a solenoid operated directional valve comprising a valve assembly and a solenoid assembly assembled together, said solenoid assembly comprising a solenoid winding which is selectively energizable to operate the directional valve, said valve assembly including a valve body and electrical means thereon via which energizing current is conducted to said solenoid winding, said electrical means including a plurality of electrical terminals arranged in a given geometric pattern and constituting a first set of terminals, the improvement which comprises a plurality of electrical terminals constituting a second set of terminals arranged on the solenoid assembly in a given geometric pattern, each terminal of said second set of terminals being connected to a corresponding point of the solenoid winding such that the solenoid winding presents different solenoid characteristics across selected ones of said second set of terminals, and electrical connector structure which is selectively positionable on the solenoid assembly for selectively connecting selected ones of said second set of terminals with said first set of electrical terminals whereby the position of said electrical connector structure on the solenoid assembly establishes the solenoid characteristics which appear at said first set of terminals.

4,412,197

ELECTROMAGNETIC RAM ACTUATOR

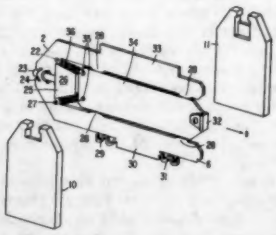
Armin Bohg, Weil im Schoenbuch, and Kurt Hartmann, Calw-Heumaden, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1982, Ser. No. 364,091

Claims priority, application Fed. Rep. of Germany, Apr. 11, 1981, 3114834

Int. Cl.³ H01F 7/08

U.S. Cl. 335—256 **5 Claims**



1. An electromagnetic ram actuator comprising:

an electromagnetic, said electromagnetic further comprising:

a first symmetrical magnetizable E-shaped yoke half having pole end faces and legs;

a second symmetrical magnetizable E-shaped yoke half having pole end faces and legs whose pole ends face the pole ends of said first E-shaped yoke half to form a plurality of aligned operating gaps;

a first coil for energizing said first E-shaped yoke half extending between the legs of said first E-shaped yoke half,

a second coil for energizing said second E-shaped yoke half extending between the legs of said second E-shaped yoke half; and

a tongue-shaped ram perpendicular to said first E-shaped yoke half and said second E-shaped yoke half, said ram arranged between said operating gaps and shiftable in the direction of the line of alignment of said operating gaps, said ram further comprising:

a plurality of armature bars of magnetizable material, each of said armature bars being associated with one of said operating gaps, the size of said armature bars each being approximately equal to the size of one of said operating gaps;

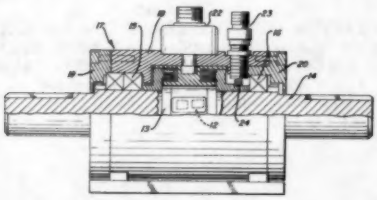
wherein said armature bars are positioned in front of said operating gaps when said electromagnet is in a non-energized state and upon energization of said electromagnet, said armature bars are pulled into said operating gaps.

4,412,198

ROTARY TRANSFORMER

Richard B. Reich, Algonquin, Ill., assignor to S. Himmelstein and Company, Hoffman Estates, Ill.

Filed Dec. 14, 1981, Ser. No. 330,078
Int. Cl.³ H01E *21/06*
U.S. Cl. 336—120 **13 Claims**



1. In a rotary transformer structure having at least one annular stator support, a rotor, at least one annular rotor support on said rotor, and a pair of annular bearings journaling said rotor in said stator support at axial spaced positions, improved transformer means including an annular excitation transformer having a first stator coil and a first rotor coil, and an annular signal transformer having a second rotor coil, a pair of annular cores each having a U-shaped cross section and being formed of a magnetically permeable material, said U-shaped cross section being defined by a bight portion and a pair of leg portions extending away from the bight portion parallel to the axis of the core, said excitation transformer being disposed in one core and the signal transformer being disposed in the other core, the improvement comprising:

means for mounting said cores to at least one of said supports intermediate said spaced bearings with said bight portions in axially spaced relationship and the legs of each core extending axially away from the other core toward the bearing outboard thereof; and

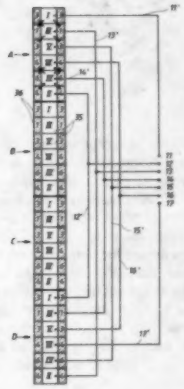
opposed permeable means extending toward each other radially intermediate said ends of the legs of the respective cores and defining small air gaps with said leg ends to cooperate with said U-shaped cores in substantially fully permeably enclosing the transformers and defining air gaps opening axially away from the other of said pair of cores whereby cross talk between said transformers is effectively minimized notwithstanding the disposition of the transformer inboard of said spaced bearings, each pair of associated permeable means and U-shaped core being mounted for coaxial relative rotation therebetween.

4,412,199

REGULATING WINDING CONNECTED IN SERIES WITH A MAIN WINDING OF A TRANSFORMER

Adrian von Reuteln, Ludvika, Sweden, assignor to ASEA Aktiebolag, Västeras, Sweden

Filed Jun. 29, 1981, Ser. No. 278,021
Claims priority, application Sweden, Jul. 8, 1980, 8005009
Int. Cl.³ H01F *15/14, 21/12*
U.S. Cl. 336—70 **4 Claims**



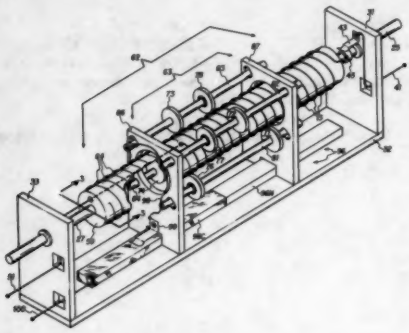
1. A regulating winding arranged in a transformer and provided with a plurality of connecting contacts, arranged at different potentials, each connecting contact representing a corresponding regulating step, said winding comprising a plurality of multi-turn, substantially helical current-carrying conductor loops, said current-carrying conductor loops being electrically insulated from each other and arranged in such a way that each one of said current-carrying conductor loops has a first end point at the one end of said winding and a second end point at the other end of said winding, a plurality of electrical connecting elements arranged to connect a plurality of said first end points to a plurality of said second end points in such a way that said helical current-carrying conductor loops are thereby series-connected with each other, each of said connecting elements being connected to a respective one of said connecting contacts, characterized in that said winding also comprises a plurality of insulated helical potential loops, each of which is arranged with at least one surface portion thereof facing an adjoining surface portion of at least one of said current-carrying conductor loops along at least part of the length thereof, each of said potential loops at one or the other end of said winding having an end point which by means of electrical connecting means, is placed in electrical connection with an end point of a corresponding current-carrying conductor loop located at the same end of the winding, whereby each potential loop has a surface portion confronting the adjacent surface portion belonging to a current-carrying conductor loop, but not to the current-carrying conductor loop which is electrically connected to that potential loop.

4,412,200

VARIABLE INDUCTOR WITH CARRIAGE FOR MULTIPLE TROLLEY WHEELS

Jack C. Thornton, Satellite Beach, Fla., and Randy G. Russell, Arlington Heights, Ill., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 1, 1982, Ser. No. 364,291
Int. Cl.³ H01F 29/06
U.S. Cl. 336—139 5 Claims



1. A variable inductor comprising:

rotatable, substantially helical coil means comprising multiple turns of electrical conductor, said multiple turns of electrical conductor having a first end and a second end;

electrically conductive contact means being situated remote from said first end;

a carriage means for being driven by and traveling along said coil means as said coil means is rotated;

said carriage means including (i) a plurality of trolley wheels and (ii) support means for holding said wheels in contact with and in a distribution around the coil means, at least one of said trolley wheels being electrically conductive and affording electrical contact with the electrical conductor;

said carriage means further including electrical connection means for electrically interconnecting said conductive wheel and said remotely situated electrically conductive contact means, said electrical connection means traveling simultaneously with the carriage means and so that as the trolley wheel travels away from the first end said electrical connection means also travels away from the first end.

4,412,201

COIL FORM AND ASSEMBLY FOR AUTOMATED MANUFACTURING OPERATIONS

Rudolf Glassauer, Oberndorfer Str. 28; Bernhard Duschl, Nussbaumstr. 35; Wilhelm Linzmeier, Tannenweg 9, and Arnold Schaffrik, Regierungstr. 545, all of 8300 Landshut, Fed. Rep. of Germany

Filed Jun. 9, 1982, Ser. No. 386,726
Claims priority, application Fed. Rep. of Germany, Jun. 30, 1981, 3125623
Int. Cl.³ H01F 15/10
U.S. Cl. 336—192 5 Claims

1. A coil assembly having a winding for electric devices such as inductive reactors, motors and the like, and adapted for manufacture by automatic machinery, comprising:

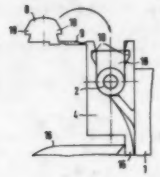
a spool-like form of insulating material for receiving and supporting said winding, said form having flanges;

first means affixed to an edge of at least one of said flanges, said first means including a pocket structure having a groove elongated in a generally tangential direction, said pocket structure including a snap-in cover;

a recess enlarging said groove over a first distance from a first end of said groove thereby forming a recess having an opening through the corresponding flange with one end of said winding passing therethrough;

second means comprising a conductive sleeve member affixed adjacent to said groove first end and initially extending normally with respect to said groove direction of elongation, said sleeve member also including a conductive pin extending normal to said sleeve member, said one end of said winding connecting to said pin;

a taper producing a bending point in said sleeve member



such that said member is bent into said recess thereby providing folding of the conductor of said one end of said winding into said recess;

a Litz wire affixed into the free end of said sleeve member, said Litz wire assuming a lay-in position in said groove when said sleeve member is bent into said recess;

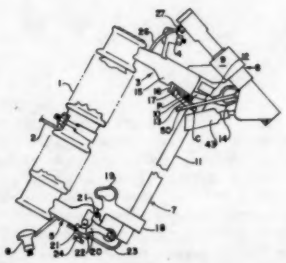
and third means associated with the inside surface of said cover to grip said Litz wire thereby providing relief against strain from external forces applied to said Litz wire.

4,412,202

ELECTRIC CIRCUIT INTERRUPTING APPARATUS

William H. Russell, Stockbridge, and Robert D. Ball, Tucker, both of Ga., assignors to Kearney-National, Inc., Atlanta, Ga.

Filed Sep. 18, 1981, Ser. No. 303,504
Int. Cl.³ H01H 71/20
U.S. Cl. 337—171 10 Claims



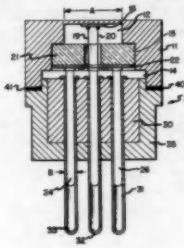
1. In combination a first electric circuit interrupter having a pair of relatively movable normally closed disconnect contacts and a fusible element disposed in a fuse holder and arranged to interrupt an overload current, and a second electric circuit interrupter having a pair of relatively movable normally closed circuit interrupting contacts arranged to interrupt load currents, said second interrupter, forming a parallel circuit to said disconnect contacts only during opening of said disconnect contacts so as to prevent arcing at said disconnect contacts during opening thereof and arranged to insure that said fuse holder will open if the disconnect contacts of the first interrupter are not engaged and latched closed following a closing operation.

4,412,203

HOUSING AND INTERCONNECTION ASSEMBLY FOR A PRESSURE TRANSDUCER

Anthony D. Kurtz, Englewood, and Joseph R. Mallon, Franklin Lakes, both of N.J., assignors to Kulite Semiconductor Products, Inc., Ridgefield, N.J.

Filed Sep. 10, 1981, Ser. No. 301,108
Int. Cl.³ G01L 1/22
U.S. Cl. 338—4 10 Claims



1. An electromechanical transducer housing and interconnection assembly, comprising:

(a) a first top cylindrical housing section having an internal hollow manifested by a top internal section of a given diameter, contiguous with a second concentric section of a larger diameter, with the top surface of said housing as under lying said top internal section providing a force responsive surface,

(b) an insulative annular member positioned in said hollow and within said second section with the central aperture of said annular member positioned concentrically with said housing sections, with the undersurface of said annular member metallized to provide separate contact land areas, with each area associated with and coupled to one depending conductive post relatively parallel to the main axis of said housing,

(c) a transducer assembly positioned within said hollow formed by said top section and positioned on the bottom of said force responsive surface, with sensor elements located on the opposite surface of said assembly said sensor elements having terminals with said terminals connected to wires with said wires directed through said central aperture of said annular member and coupled to an associated one of said land areas on said annular member,

(d) a second bottom cylindrical housing section having a plurality of apertures aligned with each of said conductive posts, each of said apertures containing an elongated tubular conductor member for accommodating said associated post, with said second housing secured to said top housing section with said posts and said tubular conductor members permanently affixed.

4,412,204

FUEL LEVEL MONITORING AND ENGINE CONTROL DEVICE

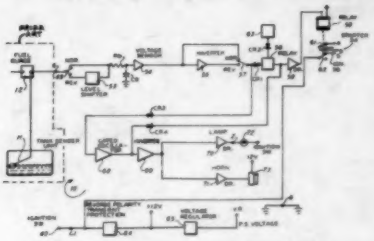
Warren H. Pagane, 16 Forbes Hill Rd., Wallaston, Mass. 02170

Continuation-in-part of Ser. No. 48,025, Jun. 13, 1979, and Ser. No. 63,276, Aug. 2, 1979, which is a continuation of Ser. No. 925,473, Jul. 17, 1978, abandoned. This application Sep. 18, 1981, Ser. No. 303,586
Int. Cl.³ B60Q 5/00; G08B 21/00
U.S. Cl. 340—59 8 Claims

1. A fuel level monitoring and engine control device for use with an engine having an electrical ignition system including an electrical ignition switch and power source, a starter system, a fuel supply tank and an electrically operated fuel gauge system, including a fuel sending unit and a fuel gauge interconnected electrically and to the power source, whereby a first signal voltage is generated to indicate the quantity of fuel in said fuel tank, said device serving to shut down the engine when the fuel supply in said tank reaches a predetermined low level but before said fuel supply is exhausted, said device comprising:

first circuit means including voltage sensing means connected to the junction of the fuel sending unit and the fuel gauge of said electrically operated fuel gauge system, whereby said voltage sensing means changes state when the first signal voltage reaches a predetermined value indicating the predetermined low level of fuel in said supply tank;

timing means electrically connected to the output of said voltage sensing means, for timing the elapsed period from



when said voltage sensing means changes state at said predetermined low level of fuel until a predetermined elapsed time has expired;

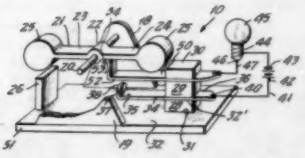
means electrically interconnected between said timing means and said electrical ignition and or said starter system, whereby said electrical ignition and or said starter system is rendered inoperative at the end of said predetermined elapsed time; and lockout circuit means electrically connected to said timing means such that for a fuel condition below said predetermined low level existing while said engine is shut down, when said electrical ignition switch is closed, said timing means responds electrically such that said electrical ignition and or starter is rendered inoperative.

4,412,205

SWITCH CONSTRUCTION RESPONSIVE TO MOTIONS OF A WEARER

Miklos Von Kemenczky, Greenville, N.J., assignor to Guilden Development Corp., N.J.

Filed Aug. 24, 1981, Ser. No. 295,841
Int. Cl.³ G08B 5/00; F21L 15/08
U.S. Cl. 340—331 15 Claims



1. An improved switch construction responsive to the motions of a wearer comprising: a relatively fixed base adapted to be secured to desired portions of the clothing of the wearer in relatively fixed relation thereto; a substantially balanced mass mounted for pivotal movement upon said base about an axis; means for limiting said pivotal movement of said mass in at least a first angular direction; a pair of electrical contact means, at least one of which lies in the path of pivotal movement of

said mass in at least one angular direction; and a source of electromotive force and an illumination means connected in series with said contact means; whereby said contact means will be closed to illuminate said illumination means only upon the occurrence of angular acceleration of said balanced mass in said at least one angular direction.

4,412,206
DIGITAL ELECTRICAL LENGTH OR ANGLE MEASURING DEVICE

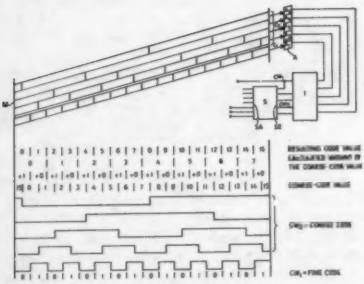
Ernst Schwefel, Traunreut, Fed. Rep. of Germany, assignor to Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Sep. 18, 1980, Ser. No. 188,276

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1979, 2938318

Int. Cl.³ H03K *13/18*

U.S. Cl. 340—347 P **7 Claims**



1. Digital electrical measuring device, particularly an absolute measuring device with means for scanning at least one value representation with code groups of different resolutions and with means for adding unambiguously higher resolution code groups to coarser resolution code groups, wherein the improvement comprises means for connecting digitalized scanning signals (code values CW) of at least one coarser resolution code group (C_2–C_n) to first addressing inputs (SE) of at least one fixed value storage (S) containing integral, non-rounded off, binary-stored calculated variants of such digitalized signals (CW) in tabular form; and means for alternately connecting such variants of the digitalized signals (CW) to outputs (SA) of said storage (S), in dependence upon the logical state of a control signal which is derived from the respective higher resolution code groups (C_1) and which is connected to a second addressing input (SE) of said storage (S), said variants including $(CW+1)/2$ for preceding signals and $(CW+0)/2=CW/2$ for non-preceding signals when the resolution of a higher resolution code group is double the resolution of a coarser resolution code group so that the calculated variants are dependent on a function of the resolution of the code groups, whereby a resolution of N-2 bits is achieved when a coarse resolution code is interconnected with an intermediate resolution code and a fine resolution code.

4,412,207
DIGITAL INDUCTION LOGGING TOOL INCLUDING A FLOATING POINT A/D

Paul L. Sinclair, Houston, Tex., assignor to Schlumberger Technical Corporation, Houston, Tex.

Filed Jun. 8, 1981, Ser. No. 271,279

Int. Cl.³ H03 *13/20*

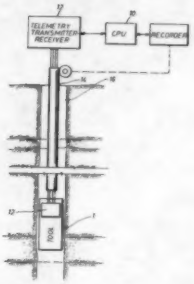
U.S. Cl. 340—347 AD **24 Claims**

1. A floating point analog-to-digital convertor for converting an input analog signal into floating point digital signals, each digital signal having a digital code representative of the exponent of a floating point number and a digital code representative of its magnitude, the convertor comprising:

(a) a voltage-to-frequency convertor for generating a digital clocking signal having a frequency proportional to the magnitude of the input analog signal;

(b) a comparator for generating a count direction control signal according to the instantaneous polarity of the analog input signal;

(c) an up-down counter responsive to the count direction control signal for counting up or counting down in response to clock pulses generating means of the digital clocking signal during a predetermined time period;



(d) a shift register having a bit position for each bit of said up-down counter and responsive to shift pulses for storing and shifting at the end of each predetermined time period the count from said up/down counter one bit position for each shift pulse in a direction to obtain a predetermined magnitude for the count contained in a predetermined sub-set number of output bits of said shift register, the set of bits having a sign bit and a most significant bit (MSB), the sub-set of shift register output bits forming the magnitude of the floating point digital sample; and

(e) a shift pulse counter for counting the number of shift pulses applied to said shift register, the count in said shift pulse counter forming the exponent of the floating point digital signal.

4,412,208
DIGITAL TO ANALOG CONVERTER

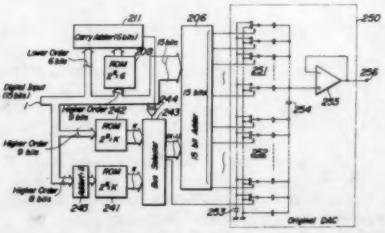
Yukio Akazawa, Iruma; Yasuyuki Matsuya, Tokyo, and Atsushi Iwata, Tokorozawa, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Sep. 3, 1981, Ser. No. 299,120

Claims priority, application Japan, Sep. 16, 1980, 55-127239; Jul. 13, 1981, 56-108135; Jul. 13, 1981, 56-108137

Int. Cl.³ H03K *13/02*

U.S. Cl. 340—347 DA **4 Claims**



1. A digital to analog converter for converting a digital input signal to an analog output signal comprising:

a first digital to analog converter for generating an output of higher order bits, said first digital to analog converter including a first capacitor array having capacitors arranged with binary weighting corresponding to a train of higher order bits of said digital input signal and a first analog switch array having analog switches for selectively connecting one terminal of each of said capacitors of said first capacitor array to a reference voltage or ground;

a second digital to analog converter for generating a full scale output as an output signal of lower order bits which is always larger than every quantizing level of said first digital to analog converter, said second digital to analog converter including a second capacitor array having capacitors arranged with binary weighting corresponding to a train of lower order bits of said digital input signal and a second analog switch array having analog switches for selectively connecting one terminal of each of said capacitors of said capacitor array to said reference voltage or ground, the other terminals of said capacitors in said first capacitor array being connected in common to an output point of said first digital to analog converter and the other terminals of said capacitors in said second capacitor array being connected in common to an output point of said second digital to analog converter;

a coupling capacitor coupling the output points of said first and second digital to analog converters, the equivalent capacitance formed by said second digital to analog converter and said coupling capacitor across the output point of said first digital to analog converter being larger than the unit capacitance of said first digital to analog converter;

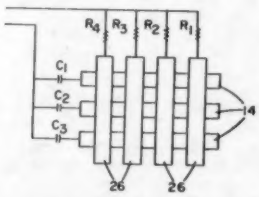
output means having its input coupled to the output point of said first digital to analog converter for generating at its output said analog output signal; and

a code converter for applying to said first and second digital to analog converters an input code obtained by shifting said digital input signal by a predetermined value such that the relationship between said digital input signal and said analog output signal is substantially linear.

4,412,209
RC ARRAY

Norman J. Frame, Whitefish Bay; James P. Walber, Cedar Grove, and Jan M. Janick, Brookfield, all of Wis., assignors to W. H. Brady Co., Milwaukee, Wis.

Filed Nov. 20, 1981, Ser. No. 323,281
Int. Cl.³ G06F *3/02*
U.S. Cl. 340—365 C **12 Claims**



1. An assembly of switches, comprising

a plurality of switch elements each including first and second electrical contacts,

a plurality of capacitors each having a different capacitance value and each having first and second electrical connections,

a plurality of resistors each having a different resistance value and each having first and second electrical connections,

a plurality of first conductors forming an electrical connection between said first capacitor connections and said first switch contacts,

a plurality of second conductors forming an electrical connection between said first resistor connections and said second switch contacts,

a first electrical lead connecting all of said second capacitor connections, for supplying a first electrical connection to external detection circuitry, and

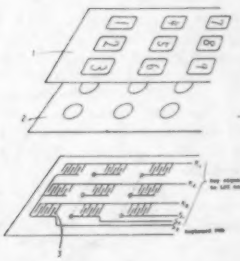
a second electrical lead connecting all of said second resistor connections, for supplying a second electrical connection to external detection circuitry,

whereby said external detection circuitry is connected to a different combination of resistance and capacitance for each of said plurality of switch elements, thereby allowing said circuitry to distinguish which of said switch elements has been activated.

4,412,210
ELECTRONIC CALCULATOR WITH ACOUSTIC CONFIRMATION OF KEY ACTUATION AND ACOUSTICAL ALARMS

Isamu Washizuka, Soraku, and Shintaro Hashimoto, Shiki, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 845,977, Oct. 27, 1977, abandoned.
This application Jul. 16, 1981, Ser. No. 283,978
Claims priority, application Japan, Nov. 1, 1976, 51-147436[U]
Int. Cl.³ G06F *3/02*
U.S. Cl. 340—365 S **2 Claims**



1. An electronic data processor apparatus including a substantially flat keyboard, said data processor being capable of audibly confirming whether any key on said substantially flat keyboard has been actuated, thereby introducing an input into said electronic data processor apparatus, said electronic data processor apparatus further comprising:

a substantially flat keyboard means responsive to the actuation of the keys on said keyboard for introducing inputs into said data processor apparatus, said substantially flat keyboard means including a predetermined number of keys grouped in respective key working areas which lie substantially in a plane, said keys on said keyboard capable of being actuated by depression of each of said keys through a substantially miniscule key stroke distance;

a processor unit means including a processor circuit means for performing an operation on said inputs, said processor unit means including a signal generator means for generating a plurality of key strobe signals, said key strobe signals being input to each of said keys on said substantially flat keyboard means, said respective keys which receive said key strobe signals passing said respective key strobe signals to said processor unit means in response to actuation of said respective keys, said processor unit means further generating a sound instruction signal indicative of the actuation of said respective keys and of the introduction of said inputs into said data processor apparatus, said sound instruction signal being generated in accordance with the receipt of said respective key strobe signals; and

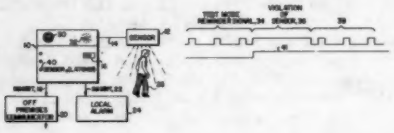
means resposive to said sound instruction signal for generating an acoustic sound in accordance with said sound in-

struction signal, thereby confirming audibly whether any key on said substantially flat keyboard means has been actually actuated and whether said inputs introduced in response to said actuation.

4,412,211
SYSTEM FOR TEST SEQUENCE ANNUNCIATION

William J. Lautzenheiser, North Billerica, Mass.; Richard A. Simonetti, Baldwin Harbor, N.Y.; Martin E. Henderson, Wayland, Mass.; James B. Edson, Concord, Mass., and Kenneth E. Beeson, Waltham, Mass., assignors to American District Telegraph Co., New York, N.Y.

Filed Aug. 28, 1981, Ser. No. 297,330
Int. Cl.³ G08B *29/00*
U.S. Cl. 340—514 **13 Claims**



1. A system for alerting the user of a security system to the placing of the security system in a walk test mode and the results of performing tests on the system comprising:

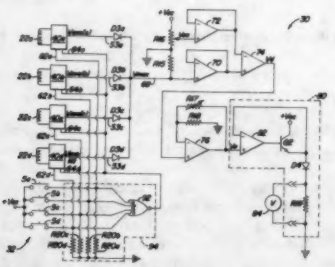
means responsive to said security system being placed in a walk test mode involving an individual moving from one local walk test location to another within a predetermined area of the security system to be tested for providing a first distinctive audible or visible test mode reminder signal throughout said predetermined area, said first signal being provided in such a manner that said first signal will be detected at a local walk test location by the individual performing the walk test; and

means for changing said first signal to a different distinctive audible or visible signal throughout said predetermined area in such a manner that said different signal will be detected at a local walk test location by the individual performing the walk test, said different signal being provided responsive to said security system responding in a predetermined manner to the walk testing of said security system at local walk test locations.

4,412,212
SHEARBAR CLEARANCE DETECTOR

Kenneth J. Kolegraff, and David T. Allen, both of Waterloo, Iowa, assignors to Deere & Company, Moline, Ill.

Filed Aug. 10, 1981, Ser. No. 291,589
Int. Cl.³ G08B *21/00*
U.S. Cl. 340—684 **10 Claims**



1. In a cutting machine having a shearbar and a plurality of blades movable with respect to the shearbar to cut material inserted therebetween, a clearance monitor for monitoring clearance between the blades and the shearbar, comprising:

a proximity sensor fixed with respect to the shearbar for sequentially generating a plurality of proximity signals, each proximity signal varying as a function of velocity and separation of the one of the plurality of blades with respect to the shearbar;

an integrator coupled to receive the plurality of proximity signals, the integrator converting each proximity signal to a gap signal having a magnitude representing a minimum separation between the sensor and the corresponding blade, the magnitude of the gap signal being substantially independent of blade velocity;

an averaging circuit coupled to sequentially receive the gap signals and generating an average gap signal representing an average over time of the minimum separations between the sensor and the plurality of blades;

means for generating an offset signal having a desired magnitude;

differential amplifier means for generating a difference signal representing a difference between the offset and the average gap signal;

variable amplifier means for generating an output signal obtained by multiplying the difference signal by a predetermined gain factor;

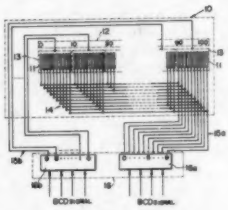
display means for generating an operator-detectable signal representing the output signal; and

adjustable means for varying the magnitudes of the offset signal and the gain factor.

4,412,213
DRIVING CIRCUIT FOR A FLUORESCENT DISPLAY APPARATUS HAVING FEWER LEADS

Takao Kishino; Toshihiro Yamaguchi, and Kazunori Tanaka, all of Mobara, Japan, assignors to Futaba Denshi Kogyo K.K., Mobara, Japan.

Division of Ser. No. 98,690, Nov. 29, 1979, Pat. No. 4,325,064.
This application Nov. 12, 1981, Ser. No. 320,527
Claims priority, application Japan, Nov. 30, 1978, 53-163766
Int. Cl.³ G09G *3/12*
U.S. Cl. 340—753 **1 Claim**



1. A fluorescent display apparatus comprising:

a vacuum casing made up of a substrate and a front cover airtightly bonded together;

a plurality of anodes each coated with a phosphor layer on the upper surfaces thereof and disposed on said substrate;

said anodes being divided into consecutive several groups so as to include a certain number of anodes in each of said anode groups;

each of said anodes disposed in corresponding positions of said respective anode groups being connected together in parallel;

a plurality of control electrodes each provided in an opposite relationship with respect to said respective anode groups;

a filamentary cathode stretched above said control electrodes for emitting thermions when energized and heated;

a first decoder means for decoding the least significant digit of an input signal and for driving a plurality of anodes

having corresponding positions in said respective anode groups with a continuous signal; and

a second decoder means for decoding at least one more significant digit of said input signal and for driving one of said control electrodes with a continuous signal, whereby one of said anodes selected by said first and second decoders representing the value of said input signal is illuminated and said fluorescent display apparatus is substantially noise-free.

4,412,214

LIQUID CRYSTAL DISPLAY ELEMENT HAVING NON-DISPLAY ELECTRODE ARRANGEMENT

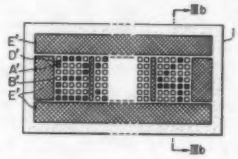
Hironari Tanaka; Tadashi Ishibashi, and Masaharu Koyama, all of Mobara, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 12, 1981, Ser. No. 273,036

Claims priority, application Japan, Jun. 16, 1980, 55-80204

Int. Cl.³ G09G 3/36

U.S. Cl. 340—765 **11 Claims**



1. A liquid crystal display element comprising:

(a) opposite upper and lower substrates having a longitudinal direction and a direction transverse thereto;

(b) a liquid crystal sandwiched between inner surfaces of said upper and lower substrates;

(c) a set of plural separated and adjacent pattern display sections, each of said display sections having a first upper electrode arrangement including a plurality of electrodes and a first lower electrode arrangement including at least one electrode, said first upper electrode arrangement being disposed on the inner surface of said upper substrate and said first lower electrode arrangement being disposed on the inner surface of said lower substrate, said first upper and lower electrode arrangement being configured so that superposing portions thereof selectively provide a plurality of predetermined display patterns, said first upper and lower electrode arrangements being adapted to be selectively applied therebetween with a selective voltage which excites the liquid crystal and a non-selective voltage which is lower than said selective voltage;

(d) a background non-display area delimited by an area around said display sections, said background non-display area including first regions at opposite first sides of said set of display sections in the longitudinal direction of each of said upper and lower substrates, second regions at opposite second sides of said set of display sections in the transverse direction of each of said upper and lower substrates, and third regions between the adjacent display sections, a second upper electrode arrangement disposed on the inner surface of said upper substrate in said background non-display area, a second lower electrode arrangement disposed on the inner surface of said lower substrate in said background non-display area, said second upper and lower electrode arrangements having superposing portions thereof at least partially covering said background non-display area, said second upper and lower electrode arrangements being adapted to be always applied therebetween with said non-selective voltage, at least the portions of said second upper electrode arrangement disposed in said second region of said background non-display area being electrically interconnected with each other and electrically isolated from said first upper electrode arrangement, and at least the portions of said second lower electrode arrangement disposed in said first and third regions of said background non-display area being electrically interconnected with each other and electrically isolated from said first lower electrode arrangement; and

(e) the voltage applying means for selectively applying said selective and non-selective voltages between said first upper and lower electrode arrangements in accordance with a pattern to be displayed and for always applying said non-selective voltage between said second upper and lower electrode arrangements irrespective of the pattern to be displayed.

4,412,215

NOVEL CONTROL MEANS FOR AN ELECTROCHROMIC DISPLAY

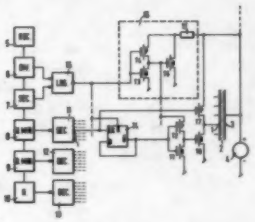
Hubert Portmann, Colombier, Switzerland, assignor to Ebauches, S.A., Switzerland

Continuation of Ser. No. 119,140, Feb. 5, 1980. This application Mar. 11, 1982, Ser. No. 357,298

Claims priority, application Switzerland, Feb. 16, 1979, 1535/79

Int. Cl.³ G09G 3/34

U.S. Cl. 340—785 **2 Claims**



1. Apparatus for controlling an electrochromic display cell having a plurality of electrode segments spaced from a counter-electrode by an electrolyte and disposed for representing different symbols according to those segments which are set in a colored state or in an bleached state by application of a current in one direction or in the other between the segments and counter-electrode, said apparatus comprising:

power supply means having a first and a second terminal, said counter-electrode being directly connected to said second terminal;

control means comprising a plurality of terminals corresponding each to one of said segments and providing each a control signal having a first state when said one segment is to be colored and a second state when said one segment is to be bleached;

means for producing a control pulse whenever at least either one of said segments is to be colored;

generator means responsive to said control pulse for producing a bias voltage pulse;

a plurality of individual supply circuit means connected each between one of said control means terminals and the corresponding segment and comprising each a first field-effect transistor whose source is connected to said first power supply terminal, whose drain is connected to said corresponding segment, and whose channel-width is substantially proportional to the area of said corresponding segment, a switching circuit responsive to said control pulse and to said first state of said control signal for applying said bias voltage pulse to the gate of said first transistor, whereby said first transistor applies a constant current pulse between said corresponding segment and said counter-electrode whenever said corresponding segment is to be set in one of its colored or bleached states, said supply circuit means further comprising a second field-effect transistor whose source is connected to said counter-elec-

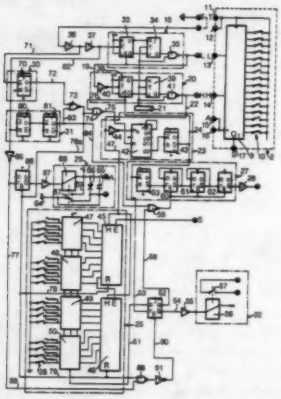
trode, whose drain is also connected to said corresponding segment and whose gate is connected to said one of said control means terminals, whereby said second transistor is responsive to said second state of said control signal for short-circuiting said corresponding segment with said counter-electrode whenever said corresponding segment is to be set in the other of its states.

4,412,216

SYSTEM FOR IDENTIFYING, FOR EXAMPLE, A PERSON FOR OPERATING AN ELECTRICAL APPLIANCE, A MECHANICAL APPLIANCE OR ANY OTHER APPLIANCE

Alain M. L. Mole, Avenue Ambroise Croisat 38400, Saint Martin d'Heres, and Jean-Louis P. J. Savoyet, La Mayrie 38770, La Motte d'Aveillans, both of France

Filed Apr. 3, 1981, Ser. No. 250,564
Claims priority, application France, Apr. 3, 1980, 80 07570
Int. Cl.³ H04Q *3/00*; E05B *49/00*
U.S. Cl. 340—825.31 **23 Claims**



1. A security system for enabling or preventing operation of an electrical, mechanical or other appliance, including in combination:

a portable key member comprising

an energizable bus, normally de-energized,

a parallel-to-serial shift register having a series of flip-flop means sequentially connected with each other, each said flip-flop means being either connected to or not connected to said bus according to a key code, so that, when said shift register is energized, the status of the series of connections and non-connections between said bus and said flip-flop means defines an identification code memorized within said portable key member, but, until such energization, said status constitutes a preprogrammed passive-type memory,

a fixed lock member secured to said appliance and controlling its operation, normally preventing such operation. While permitting it when unlocked, and comprising

key-receiving means for coupling with said key member,

electric power supply means for energizing said first shift register upon coupling with said key member,

single pulse loading means powered by said electric power supply means for supplying a single pulse to said shift register upon coupling of said key member and said lock member to cause thereby each of said flip-flop means to take a status depending upon the status of its said corresponding individual connection or non-connection to said bus and to load said identification code into said shift register,

electronic means for serially receiving the contents of said shift register after actuation thereof by said loading means, and

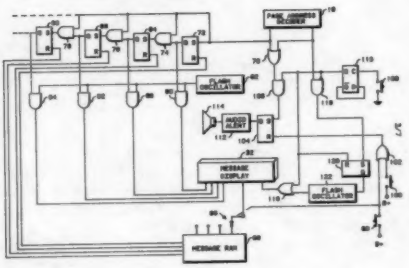
comparison means for comparing said identification with a code memorized into said lock, and for unlocking said lock member if they coincide.

4,412,217

PAGER WITH VISIBLE DISPLAY INDICATING STATUS OF MEMORY

David F. Willard, Plantation, and Gerald W. Tidwell, Sunrise, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 29, 1981, Ser. No. 306,800
Int. Cl.³ H04B *5/04*; H04M *11/00*; H04Q *9/00*
U.S. Cl. 340—825.44 **12 Claims**



1. In a pager, a method of indicating a number of received pages comprising the steps of:

incrementing a register when a page is received; and

displaying a count from the register, which count is a measure of the number of received pages.

4,412,218

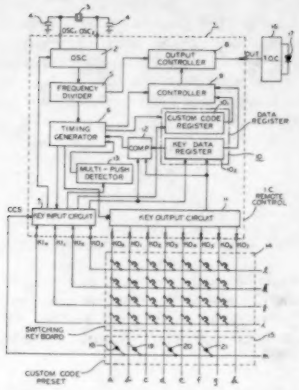
REMOTE CONTROL SIGNAL TRANSMITTER CAPABLE OF SETTING CUSTOM CODES INDIVIDUALLY ALLOTED TO A PLURALITY OF CONTROLLED INSTRUMENTS

Shigeo Niitsu, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1981, Ser. No. 234,507
Claims priority, application Japan, Feb. 26, 1980, 55-23166
Int. Cl.³ H04Q *9/00*
U.S. Cl. 340—825.56 **5 Claims**

1. A transmitter comprising generating means for generating cyclically recurring scan signals, scan signal output terminals through which said respective scan signals are output, a key matrix circuit means having a plurality of column lines and a plurality of row lines connected to said respective scan signal output terminals, key input terminals connected to said respective column lines, a custom code selection terminal, custom code designation means for selectively connecting said scan signal output terminals to said custom code selection terminal

in accordance with a custom code corresponding to an identity of an instrument to be controlled, and output means for outputting a custom code derived from said custom code selection terminal and key data derived from said key matrix circuit.



4,412,219
SECONDARY RADAR RESPONDERS

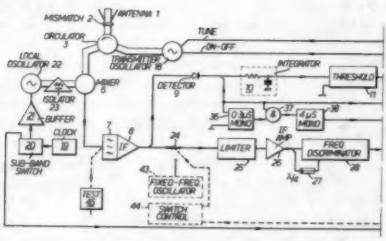
John N. Briggs, Kirby Muxloe, England, assignor to The Marconi Company Limited, Chelmsford, England

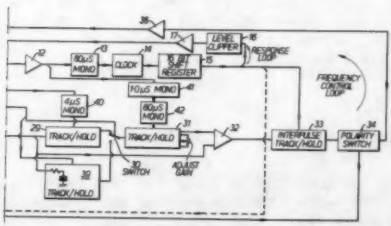
Filed Dec. 31, 1980, Ser. No. 221,732

Claims priority, application United Kingdom, Jan. 19, 1980, 8001833

Int. Cl.³ G01S *13/80*

U.S. Cl. 343—6.8 R **18 Claims**





1. A secondary radar responder including means for receiving an interrogation pulsed radar signal, a transmitter for transmitting a pulsed response thereto in response to a received single pulse of said interrogation signal, means for monitoring the difference in frequency between said received single pulse and said transmitted response, and means for modifying the frequency of the transmitted response during transmission so as to reduce the difference, wherein said monitoring means comprise storage means for storing a signal representative of the frequency of said single pulse of said interrogation signal, and means for comparing a signal representative of the frequency of the transmitted response with the stored signal whereby the result of said comparison is used to modify the frequency of the transmitted response.

4,412,220
DIGITAL SCAN CONVERTER

Jan Aanstoot, Enter, and Bernard H. M. Oude Elberink, Oldenzaal, both of Netherlands, assignors to Hollandse Signaalapparaten B.V., Hengelo, Netherlands

Filed Apr. 6, 1981, Ser. No. 251,675

Claims priority, application Netherlands, Apr. 14, 1980, 8002171

Int. Cl.³ G01S *7/44*

U.S. Cl. 343—55 C **4 Claims**

1. Digital scan converter for a pulse radar apparatus provided with: a random-access memory (1), each cell of which containing brightness data; a circuit (3) connected to the memory (1) for reading out the brightness data and for presenting corresponding video signals on a raster scan display (2) at positions corresponding with the respective cells; a control unit (15) for supplying persistence data and address information to process the persistence data; switching means (17) for passing either radar video signals or the persistence data; and a logical unit (7) for supplying, in response to the radar video signals and the persistence data, respectively, and to the brightness data stored in memory (1), new brightness data overwriting that stored in memory (1), whereby the memory positions are determined by an address conversion circuit (10) which converts the radar video addresses and the persistence data addresses established in polar coordinates by the pulse radar apparatus and the control unit (15), respectively, into addresses expressed in Cartesian cordinates, characterised in that, to renew the stored brightness data, either simultaneously with a radar scan or between the generation of two successive radar scans, synchronously with a radar scan in obtaining a desired persistence on the raster scan display (2), the digital scan converter is provided with: a control code circuit (21) for supplying, in response to signals form the control unit (15) determining the conditions for and the frequency of the persistence data processing, a signal to indicate that only a radar scan must be presented on the display, a signal to indicate that simultaneously and in the same sequence therewith persistence data must be processed, or a signal to indicate that only persistence data must be processed in the same sequence as a radar scan; and a control code register (19) in which the signals supplied via the switching means (17) are supplemented with the output signals of the control code circuit (21).

4,412,221
ANTENNA SYSTEM FOR AIRBORNE TRANSCEIVER PROVIDING QUASI CONTINUOUS RECEPTION AND TRANSMISSION FREE FROM SHADOWING BY AIRCRAFT STRUCTURE

Brian P. Stapleton, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Jul. 28, 1978, Ser. No. 928,926

Int. Cl.³ H01Q *1/28*

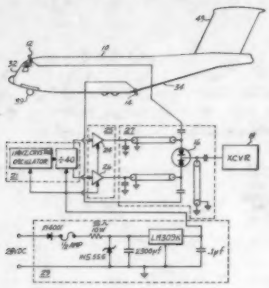
U.S. Cl. 343—705 **1 Claim**

1. An aircraft antenna system utilizing high frequency lobe switching between antennas for providing hemispherical coverage and reducing shadowing including:

a first one quarter wavelength blade antenna disposed on the top centerline of the fuselage of an aircraft for providing forward coverage below the horizon;

a second one quarter wavelength blade antenna disposed on the bottom centerline of the fuselage of an aircraft for providing aft coverage above the horizon; and

a switching circuit coupled between said first one quarter wavelength blade antenna and said second one quarter wavelength blade antenna and adapted for coupling to utilization means, said switching circuit including a solid state lobing switch for alternating between said first one quarter wavelength blade antenna and said second one quarter wavelength blade antenna;



wherein said lobing switch is operative at a frequency exceeding that required to satisfy the Nyquist criteria for information transmitted and received by the antenna system, the operating frequency of said lobing switch exceeding 6 KHz; and,

wherein the operating frequency of said lobing switch is 25 KHz.

4,412,222

DUAL POLARIZED FEED WITH FEED HORN

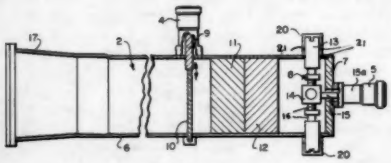
Günter Möhring, Langenhagen, Fed. Rep. of Germany, assignor to Kabel- und Metallwerke Gutehoffnungshütte Aktiengesellschaft AG, Hanover, Fed. Rep. of Germany

Filed Jul. 2, 1981, Ser. No. 280,712

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027497

Int. Cl.³ H01Q *13/02, 19/13*

U.S. Cl. 343—779 **14 Claims**



1. In a dual polarized feed having a feed horn for the separation of two linearly polarized electromagnetic waves for the irradiation of a directional antenna with a parabolic reflector, and comprising a circular tube length which is closed by a short-circuit plate on the side thereof facing away from the reflector and on the side facing the reflector has the feed horn with an aperture which widens in the direction towards the reflector, and two feeder lines which conduct the electromagnetic waves are separately connected to the tube length in such a manner that they lie in one plane one behind the other with respect to the reflector, the improvement wherein

each of the feeder nes being formed as a high frequency coaxial cable comprising an inner conductor and a concentric outer conductor and a dielectric separating said outer conductor from the inner conductor,

an inductive sensor being disposed at the short-circuit plate, the latter being disposed at an end side of the tube length, one of said coaxial cables is connected to said inductive sensor, said one coaxial cable at a connection place is operatively connected in the axial direction of the tube length to the latter,

a capacitive sensor being connected to the other of said coaxial cables, said other coaxial cable is operatively connected radially to the tube length at another connection place,

a flat short-circuit plate extending from wall to wall of the tube length is arranged between the said connection places of said two coaxial cables.

4,412,223

ANTENNA ARRAY WITH ELEMENT ISOLATION IN THE COUPLING NETWORK

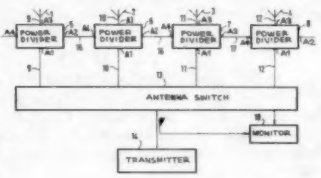
Werner Kautz, Korntal, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jul. 10, 1981, Ser. No. 282,320

Claims priority, application Fed. Rep. of Germany, Jul. 19, 1980, 3027451

Int. Cl.³ H01Q *21/06*

U.S. Cl. 343—844 **6 Claims**



1. In an antenna array including a plurality of individual antenna elements each activated by an antenna switching device and a plurality of RF lines each connecting a different one of said plurality of antenna elements to said switching device, an improvement comprising:

a plurality of reciprocal power dividers to isolate adjacent ones of said plurality of antenna elements from each other, each of said plurality of power dividers being associated with a different one of said plurality of antenna elements and disposed in an associated one of said plurality of RF lines, each of said plurality of dividers having four terminals, a first of said four terminals being connected to said antenna switching device, a second of said four terminals being connected to an associated one of said plurality of antenna elements, a third of said four terminals being connected to one of said plurality of power dividers associated with a first adjacent one of said plurality of antenna elements and a fourth of said four terminals being connected to another of said plurality of power dividers associated with a second adjacent one of said plurality of antenna elements.

4,412,224

METHOD OF FORMING AN INK-JET HEAD

Hiroshi Sugitani, Machida, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 30, 1981, Ser. No. 325,822

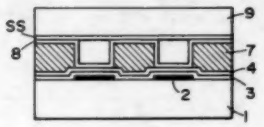
Claims priority, application Japan, Dec. 18, 1980, 55-180202

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—1.1 **5 Claims**

1. A method for forming an ink-jet head comprising an ink flow path provided with an element for generating ink-jet pressure and having an ink ejecting nozzle, characterized in

that said ink flow path and the nozzle are formed by a technique of "photo-forming" directly on a substrate having previ-



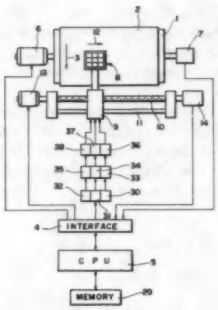
ously disposed thereon the element for generating ink-jet pressure.

4,412,225

METHOD FOR COLOR REPRESENTATION USING COLORED INK DOTS

Kazutaka Yoshida, and Hideo Horiuchi, both of Minamiashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 8, 1982, Ser. No. 346,908
Claims priority, application Japan, Feb. 6, 1981, 56-15655
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—1.1 **8 Claims**



1. A method for representing a complex color wherein a plurality of different color ink drops are deposited on a dot matrix, said method comprising:

providing a mean-value color mixture of a complex color to be represented in low and middle density so as to deposit at least two kinds of different color ink drops on a dot matrix in such a way as to permit a single ink drop to be disposed in each of the greater part of the cells of the dot matrix; and

applying a subtractive color mixture to a complex color to be represented in high density so as to deposit at least two kinds of different color ink drops on a dot matrix in such a way as to permit at least two kinds of ink drops to be superimposed in each of the greater part of the cells of the dot matrix.

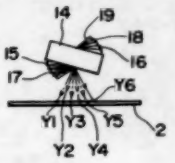
4,412,226

INK-JET PRINTING METHOD

Kazutaka Yoshida, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 8, 1982, Ser. No. 346,909
Claims priority, application Japan, Feb. 6, 1981, 56-15657
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—1.1 **5 Claims**

1. In a method for painting images with ink dots deposited on a recording medium by a plurality of ink-jet heads disposed close to said recording medium, wherein said recording medium moves in a primary scanning direction and said plurality of ink-jet heads move intermittently in a secondary scanning direction perpendicular to the primary scanning direction; the improvement comprising providing ink-jet heads equal in number to the least common multiple of arbitrary integers m and n; arranging said ink-jet heads in such manner that ink dots are deposited with separation by a distance equal to the size of



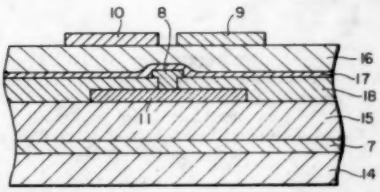
a single cell of a dot matrix used in the secondary scanning direction; and dividing said ink-jet heads into a plurality of sub-groups of ink-jet heads, each sub-group containing a number of heads equal to a whole number factor of the number of possible dots in a said matrix, said whole number factor being greater than one.

4,412,227

THERMAL HEAD

Toshihisa Hamano, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jun. 9, 1982, Ser. No. 386,823
Claims priority, application Japan, Jun. 10, 1981, 56-88043
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **4 Claims**



1. A thermal head having reading and thermal printing sections, comprising;

electrode (7) connected to a heat generating resistor driving power line (7') formed on a substrate (14):

a photo-conductive layer (15) formed on said electrode;

photo-sensor electrode means (11) formed on said photo-conductive layer;

a gate electrode (8) connected to said photo-sensor electrode means;

thin film transistor (TFT) semiconductor means (16) formed, through a gate insulating film (17), on said gate electrode;

a source electrode formed on said thin film transistor semiconductor and connected to said power line (7') for driving a heat generating resistor (12);

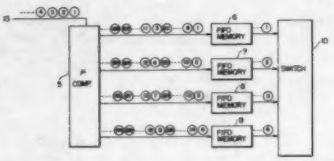
a drain electrode (10) formed on said thin film transistor semiconductor so as to be isolated from said source electrode, said drain electrode being connected to said heat generating resistor (12); and

a driving power line (6) connected to said heat generating resistor.

4,412,228
HEAT-SENSITIVE RECORDING HEAD DRIVING METHOD

Haruhiko Moriguchi, and Tomio Murayama, both of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 18, 1980, Ser. No. 217,606
Claims priority, application Japan, Dec. 18, 1979, 54-163598
Int. Cl.³ G01D 15/10
U.S. Cl. 346—76 PH 6 Claims



4. A system of driving a heat-sensitive recording head having leads alternately arranged on an insulated substrate with leads extending alternately to one side or the other and being parallel with one another and heat-generating elements disposed between adjacent leads comprising;

a microcomputer receiving an input data signal and dividing the data therein in a predetermined manner into discrete data blocks and said microcomputer rearranging the data in each data block in a predetermined manner,

a plurality of memories disposed in parallel and receiving the outputs of said microcomputer,

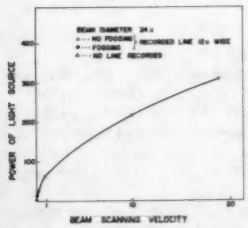
a series of shift registers receiving data from said memories to be applied successively to the leads on one side of said recording head, and

switch means to gate said data from said memories to said shift registers.

4,412,229
LINE RECORDING METHOD

Minoru Wada, and Satoshi Yoshida, both of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Saitama, Japan

Filed Aug. 13, 1981, Ser. No. 292,518
Claims priority, application Japan, Aug. 19, 1980, 55/113764
Int. Cl.³ G01D 9/42, 15/10
U.S. Cl. 346—108 1 Claim

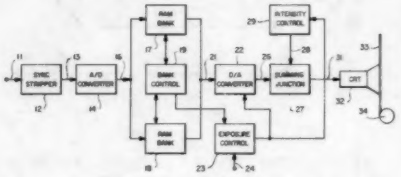


1. A recording method for recording a line image on a heat-mode recording medium comprising the steps of moving a light spot from a light source over the surface of a heat-mode recording medium; determining the velocity of and providing a velocity signal V corresponding to the speed of the light spot on the medium; and simultaneously regulating the power output of the light source so that the intensity is substantially proportional to the square root of the value of V.

4,412,230
APPARATUS AND METHOD FOR PRODUCING IMAGES ON A PHOTOSENSITIVE MEDIA

Paul R. Goldberg, Palo Alto, Calif., assignor to Wavetek Indiana, Inc., Mountain View, Calif.

Filed Sep. 21, 1981, Ser. No. 303,876
Int. Cl.³ G01D 9/02
U.S. Cl. 346—110 R 14 Claims



1. A system of the type forming line displays on line scan cathode ray tube for recording on a photosensitive medium moved past said cathode ray tube to form a graphic display on the photosensitive media which is exposed during each line display as the media is moved past the tube comprising

storage means for storing signals corresponding to lines of input data

means for reading each stored line of input data a plurality of times to provide a predetermined number of repetitive scan signals for each line of input data

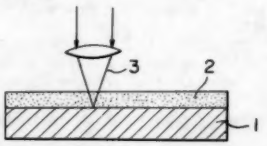
means forming a control signal which is related to media speed past the cathode ray tube

means for receiving said repetitive scan signals and the control signal and controlling the amplitude of selected ones of said scan signals responsive to the control signal whereby to control the recording media exposure for each stored line of input data.

4,412,231
LIGHT RECORDING MEDIUM

Kenryo Namba; Akihiko Kuroiwa, and Shiro Nakagawa, all of Tokyo, Japan, assignors to TDK Electronics Co., Ltd., Tokyo, Japan

Filed Mar. 29, 1982, Ser. No. 362,652
Claims priority, application Japan, Sep. 28, 1981, 56-152126
Int. Cl.³ G01D 15/34
U.S. Cl. 346—135.1 2 Claims



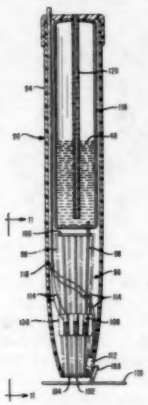
1. In a light recording medium which has a substrate and a recording layer provided on said substrate and effects recording of information by selective removal or deformation of the recording layer by laser light, the light recording medium which is characterized by that said recording layer contains an organic dye as a light absorber, said dye is a mixed dye obtained by mixing a plurality of dyes having different light absorbing wavelengths from each other and the recording layer has a light absorptivity of 80% or more at the whole wavelengths in the range of 400–900 nm in wavelength.

4,412,232

INK JET PRINTER

Helmut Weber, Augsburg; Peter H. Reitberger, Munich; Leonhard Bader, and Walter König, both of Augsburg, all of Fed. Rep. of Germany, assignors to NCR Corporation, Dayton, Ohio

Filed Apr. 15, 1982, Ser. No. 368,611
Int. Cl.³ G01D 15/18
U.S. Cl. 346—140 R 10 Claims



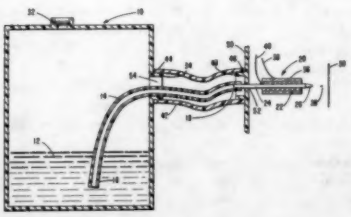
2. An ink jet printer including a print head having at least one piezoelectric driving element selectively energizable to cause ejection of a droplet of ink through a nozzle associated therewith, an ink reservoir for supplying ink to said print head, and capillary means connecting the interior of the ink reservoir with the ambient atmosphere with one end of said capillary means being so arranged as to be immersed in operation in ink contained in the reservoir, the reservoir being air-tight in operation apart from the provision of said capillary means whereby a predetermined underpressure is maintained in respect of the ink in said nozzle, any increase in underpressure as ink droplets are ejected being inhibited by virtue of the intake of air into the reservoir via said capillary means.

4,412,233

INK EVAPORATION PREVENTION MEANS FOR INK JET PRINT HEAD

Jacob E. Thomas, Ithaca, and James K. McKnight, Trumansburg, both of N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 7, 1982, Ser. No. 385,956
Int. Cl.³ G01D 15/16
U.S. Cl. 346—140 R 24 Claims



21. Means for maintaining ink constituency comprising ink supply means, a print head operably associated with the ink supply means for utilizing the ink,

means carrying ink from the supply means to the print head, and

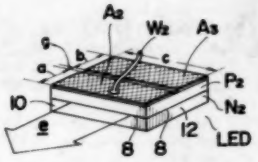
means operably connected with the ink supply means and with the print head and extending the ink vapor pressure environment of the ink supply means therebetween.

4,412,234

LIGHT EMITTING DIODE

Motonobu Matsuda, Kawachinagano, and Yoshihiro Tanaka, Osaka, both of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Mar. 16, 1981, Ser. No. 244,321
Claims priority, application Japan, Apr. 1, 1980, 55-43351; Jan. 22, 1981, 56-8706
Int. Cl.³ H01L 33/00, 23/48, 23/28, 25/04
U.S. Cl. 357—17 4 Claims



1. A light emitting diode comprising:

a pair of semiconductor layers having a planar P-N junction therebetween, said semiconductor layers having at least one side surface extending transversely across said P-N junction and from which light is emitted in a direction parallel with the plane of said P-N junction;

a pair of electrodes on the respective outer surfaces of said pair of semiconductor layers parallel with the plane of said P-N junction plane, at least one of said pair of electrodes covering an area less than the total area of said P-N junction and being located adjacent to said one side surface from which the light is emitted, the remainder of the area of the outer surface of said semiconductor layer not being covered by said electrode; and

a light shielding member covering said remainder of the area of the outer surface of said semiconductor layer which is not covered by said one electrode, said light shield member is made of a material identical with that of said one electrode, and being insulated from said one electrode, and said light shielding member and said one electrode being spaced from each other to define a gap therebetween for insulating them from each other.

4,412,235

INTEGRATED OPTO-ELECTRONIC RELAY USING A SEMICONDUCTOR WITH PERSISTENT PHOTOCONDUCTIVITY AND A MATRIX OF SUCH RELAYS

Daniel Bois, 9, rue de la Grange, 38240 Meylan, France

Filed Feb. 12, 1981, Ser. No. 234,005
Claims priority, application France, Feb. 21, 1980, 80 03814
Int. Cl.³ H01G 31/12, 27/14
U.S. Cl. 357—19 7 Claims

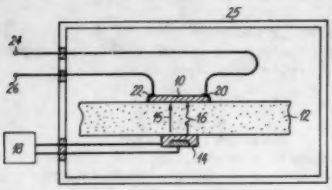
1. An integrated opto-electronic relay comprising:

an insulating substrate made of a first semiconductor material;

a layer of a second semiconductor material having a persistent photoconductivity, said layer being deposited on said substrate, said layer being provided with two electrical contacts;

a diode made of a third semiconductor material, said diode being integrated into said substrate facing the layer and being able to emit optical radiation directed onto said

layer through said substrate when it is forward biased and to emit thermal radiation directed onto said layer through



said substrate when it is reverse biased, an enclosure to enable low temperature control of the layer having persistent photoconductivity.

4,412,236

COLOR SOLID-STATE IMAGER

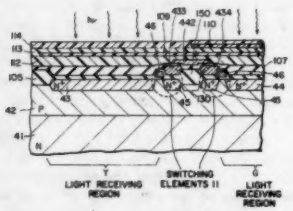
Akira Sasano; Toshio Nakano, both of Tokyo; Ken Tsutsui, Hachioji; Michiaki Hashimoto, Yono; Tadao Kaneko; Norio Koike, both of Tokyo, and Akiya Izumi, Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 21, 1980, Ser. No. 180,042

Claims priority, application Japan, Aug. 24, 1979, 54/107262; Oct. 3, 1979, 54/126844

Int. Cl.³ H01L *27/14, 29/78, 27/02*

U.S. Cl. 357—31 **16 Claims**



1. A color solid-state imager comprising:

a semiconductor body including a plurality of light receiving regions which each include a photosensor element and a switching element located in a major surface of said semiconductor body, each of said switching elements having an output terminal coupled thereto;

a color filter formed over said major surface of said semiconductor body to cover said plurality of light receiving regions; and

a shading layer interposed between said color filter and said major surface of said semiconductor body to cover at least a portion of said output terminals of said switching elements.

4,412,237

SEMICONDUCTOR DEVICE

Nobutake Matsumura, Tokyo; Ryusuke Hoshikawa, Sagamihara; Yoshihide Sugiura, Tokyo; Hiroaki Ichikawa, Yokohama, and Syoji Sato, Sagamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP78/00048, § 371 Date Aug. 29, 1979, § 102(e) Date Aug. 29, 1979, PCT Pub. No. WO79/00461, PCT Pub. Date Jul. 26, 1979

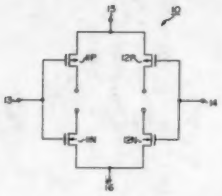
PCT Filed Dec. 11, 1978, Ser. No. 143,472

Claims priority, application Japan, Dec. 30, 1977, 52-158445

Int. Cl.³ H01L *27/02*

U.S. Cl. 357—42 **17 Claims**

1. A semiconductor device having a large number of basic cells on a semiconductor substrate, the basic cells being arranged along rows and columns of the semiconductor substrate, characterized in that each said basic cell is comprised of a first P-channel MIS transistor, a first N-channel MIS transistor, a second P-channel MIS transistor and a second N-channel MIS transistor, wherein the gates of the first P-channel and N-channel MIS transistors are commonly connected to each other by the same electrode material, the gates of the second P-channel and N-channel MIS transistors are commonly connected to each other by the same electrode material, the sources or the drains of both the first and second P-channel MIS transistors occupy a single P-type region and are connected to each other and the sources or the drains of both the first and second N-channel MIS transistors occupy a single N-type region and are connected to each other, interconnecting lines being distributed on the semiconductor substrate, said interconnecting lines being selectively distributed adjacent the basic cells, whereby a variety of functional circuits can be obtained by suitably utilizing one or more of the basic cells, wherein in each of the basic cells, the first and second common gates are arranged in parallel to each other and, at the same time, are extended from one side to the other side of the basic cell.



4,412,238

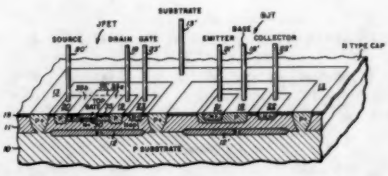
SIMPLIFIED BIFET STRUCTURE

Wadie N. Khadder, Sunnyvale; Jia T. Wang, San Jose, and Brian E. Hollins, Los Altos, all of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed May 27, 1980, Ser. No. 153,486

Int. Cl.³ H01L *27/04*

U.S. Cl. 357—43 **3 Claims**



1. A monolithic semiconductor integrated circuit having bipolar junction transistors that incorporate emitter and base elements diffused into collector element semiconductor material, and including at least one junction field effect transistor, said field effect transistor comprising:

a lower gate region located in a portion of said collector element semiconductor material;

spaced apart source and drain regions composed of said base element material;

a subsurface channel located below the surface of said semiconductor, having the same conductivity type as said source and drain regions, and extending therebetween; and

a top cap electrode having a conductivity type opposite to that of said channel, extending over the entire integrated

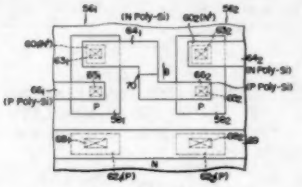
circuit, and having an integrated net concentration of the order of 2×10^{12} carriers per square centimeter within a few tenths of a micrometer of said semiconductor surface so as to prevent field inversion, below an electrode voltage of about 50 volts, in said collector element semiconductor material in addition to providing for a subsurface channel action.

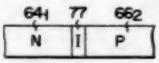
4,412,239

POLYSILICON INTERCONNECTS WITH PIN POLY DIODES

Hiroshi Iwasaki, and Osamu Ozawa, both of Yokohama, Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Apr. 7, 1980, Ser. No. 137,648
Claims priority, application Japan, Apr. 9, 1979, 54-42819
Int. Cl.³ H01L *27/10, 23/52, 29/04*
U.S. Cl. 357—44 **4 Claims**





1. A semiconductor device comprising:
a semiconductor substrate;
an integrated circuit having a plurality of bipolar transistors formed in the substrate, each transistor including a diffusion layer of P conductivity type and a diffusion layer of N conductivity type;
a polysilicon film of P conductive type formed as an electrode on the diffusion layer of P conductivity type of each transistor:
a polysilicon film of N conductivity type formed as an electrode on the diffusion layer of N conductivity type of each transistor;
a P-N junction formed between the P and N polysilicon films; and
a PIN diode formed at the P-N junction.

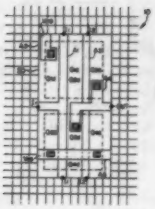
3. A semiconductor device comprising:
a semiconductor substrate;
an integrated circuit having a plurality of bipolar transistors formed in the substrate, each transistor including a diffusion layer of P conductivity type and a diffusion layer of N conductivity type;
a polysilicon film of P conductivity type formed as an electrode on the diffusion layer of P conductivity type of each transistor;
a polysilicon film of N conductivity type formed as an electrode on the diffusion layer of N conductivity type of each transistor; and
an amorphous portion provided between the P and N polysilicon films and connecting the P and N polysilicon films.

4,412,240

SEMICONDUCTOR INTEGRATED CIRCUIT AND WIRING METHOD

Hideo Kikuchi; Shigenori Baba, both of Yokohama, and Shuji Sato, Sagamihara, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

PCT No. PCT/JP80/00025, § 371 Date Oct. 27, 1980, § 102(e) Date Oct. 15, 1980, PCT Pub. No. WO80/01859, PCT Pub. Date Sep. 4, 1980
PCT Filed Feb. 22, 1980, Ser. No. 198,131
Claims priority, application Japan, Feb. 27, 1979, 54-22289
Int. Cl.³ H01L *27/00*
U.S. Cl. 357—45 **13 Claims**



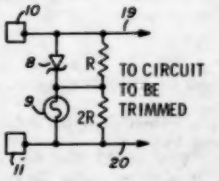
1. A semiconductor integrated circuit having a top side of overlapped wiring layers, each layer having a respective minimum wiring pitch, said circuit comprising:
connection wirings formed on respective ones of said overlapped wiring layers, and spaced in accordance with a grid having square meshes with an interval which is larger than a length corresponding to a minimum dimension for patterning in a manufacturing process for making said integrated circuit and corresponding to the respective wiring pitches of the overlapped wiring layers, said respective wiring pitches being expressed by a maximum integer unit which is not a prime number; and
circuit cells respectively connected to corresponding ones of said connection wirings, said circuit cells having vertical and horizontal dimensions corresponding to respective integer multiples of said interval, and terminals spaced in accordance with said grid, for connection to corresponding ones of said connection wirings.

4,412,241

MULTIPLE TRIM STRUCTURE

Carl T. Nelson, Sunnyvale, Calif., assignor to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 21, 1980, Ser. No. 209,248
Int. Cl.³ H01L *27/02;* **G05F** *3/00, 5/00, 7/00*
U.S. Cl. 357—51 **10 Claims**



1. A multiple trim structure for use in semiconductor integrated circuits and having a nominal output resistance value wherein a trimming operation can either raise or lower said nominal output value, said structure comprising:
a plurality of bonding pads;
a network of resistance elements coupled between a pair of

said bonding pads, said network presenting an output resistance value that can be varied by trimming;

a combination of zener diode means and fuse element means coupled between said pair of bonding pads and to said network of resistance elements whereby selected ones of said resistance elements can be invoked;

means for coupling current pulses to said pair of bonding pads whereby a selected fuse element can be blown so as to remove a short circuit across a portion of said network thereby raising said output resistance; and

means for coupling current pulses to said pair of bonding pads whereby a selected zener diode can be zapped so as to add a short circuit across a portion of said network thereby lowering said output resistance.

4,412,242

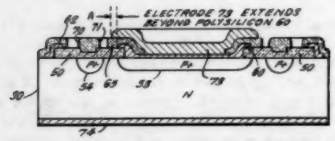
PLANAR STRUCTURE FOR HIGH VOLTAGE SEMICONDUCTOR DEVICES WITH GAPS IN GLASSY LAYER OVER HIGH FIELD REGIONS

Thomas Herman, Redondo Beach, and Alexander Lidow, Manhattan Beach, both of Calif., assignors to International Rectifier Corporation, Los Angeles, Calif.

Filed Nov. 17, 1980, Ser. No. 207,123

Int. Cl.³ H01L 29/34

U.S. Cl. 357—52 **15 Claims**



1. A high voltage semiconductor device comprising a chip of semiconductor material; at least one P-N junction formed in at least one surface of said chip; electrode means connected to at least a selected area of said surface whereby, upon application of a reverse-biasing voltage to said electrode means, an electric field is produced in said chip of semiconductor material; a thin glassy layer of insulation material overlying and sealing at least portions of said one surface of said chip; a second insulation layer of material which is not subject to polarization effects disposed between said glassy layer and said first surface of said chip; said glassy layer being polarizable by electric fields having at least a component parallel to said thin glassy layer; and first and second coextensive spaced elongated gaps in said glassy layer to reduce polarization effects therein and to reduce the adverse influence of polarization adjacent said gaps on the electric field within said chip under reverse-bias conditions; a guard ring formed in said first surface of said chip closely adjacent to but spaced from the outer periphery of said chip; said guard ring having a conductivity type opposite to that of the chip in which said guard ring is formed; said first and second gaps being located above and extending along opposite sides respectively of said guard ring.

4,412,243

METHOD OF REPRODUCING COLORED MOTION PICTURES

Walter Jaeger, Cureglia, Switzerland, assignor to GX-Holding AG, Basel, Switzerland

Filed Apr. 11, 1980, Ser. No. 139,292

Claims priority, application Switzerland, Apr. 12, 1979, 3497/79

Int. Cl.³ H04N 9/07

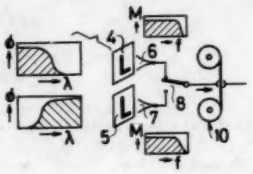
U.S. Cl. 358—334 **7 Claims**

1. In a method of reproducing a moving colored picture on the screen of a television receiver, including the steps of:

optically splitting the picture into two images; filtering the images to extract different colors therefrom; sequentially scanning the color extract images to generate a corresponding time spaced single sequence of video signals;

repeating the scanning of at least one of the two images;

inserting a corresponding repeated signal sequence between the time spaced signal sequences to establish a continuous uninterrupted signal train from which the color signals are separated;



retrieving the stored signals within time spaced signal sequences respectively corresponding to at least one of the color extract images; and

separating said time spaced signal sequences into three primary color signals for modulating a video information signal carrier.

4,412,244

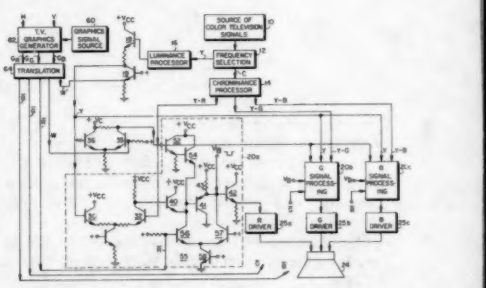
SWITCHING CIRCUIT FOR TELEVISION RECEIVER ON-SCREEN DISPLAY

Robert L. Shanley, II, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Nov. 20, 1981, Ser. No. 323,197

Int. Cl.³ H04N 9/535

U.S. Cl. 358—22 **19 Claims**



1. In an image reproducing system including a kinescope for displaying an image in response to image representative signals applied thereto; a source of image representative video signals; a source of auxiliary image representative graphics signals; and a signal path for coupling image representative signals to said kinescope; graphics display control apparatus comprising:

means coupled to said source of graphics signals for deriving therefrom first and second control signals for timing the display of auxiliary graphics information by said kinescope during intervals within picture intervals of said video signals;

a video coupling transistor responsive to said video signals and having an output coupled to said signal path;

a graphics coupling transistor responsive to said first control signal and having an output coupled to said signal path;

a current source; and

a controlled current steering network coupled to said current source and having first and second outputs coupled to said signal path, said current steering network being controlled in response to said second graphics control signal

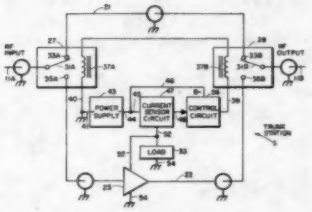
for selectively supplying an operating current from said current source to said video coupling transistor via said first output, and to said graphics coupling transistor via said second output.

4,412,245

DIFFERENTIAL CURRENT DETECTOR IN CABLE TELEVISION TRUNK AMPLIFIER STATION

Sai W. Kwok, El Paso, Tex., assignor to GTE Products Corporation, Stamford, Conn.

Filed Oct. 1, 1980, Ser. No. 193,315
Int. Cl.³ H04N 7/10
U.S. Cl. 358—86 29 Claims



1. Apparatus for detecting a differential decrease in a DC current that exceeds a prescribed value, comprising:

comparator means having first and second input terminals and an output terminal, said comparator means producing a first output voltage when the input voltage at said first terminal is greater than that on said second terminal and producing a second output voltage when the input voltage at said second terminal is greater than that at said first terminal,

first means producing a signal voltage Vs proportional to the magnitude of the DC current,

second means operative for producing a control voltage,

third means responsive only to a first output voltage for decreasing the magnitude of the control voltage a prescribed amount from what it is when said comparator means produces a second output voltage,

fourth means coupling a representation of the signal voltage to said first input terminal of said comparator means, and coupling a representation of the control voltage to said comparator means second input terminal that changes more rapidly than a representation thereof that it couples to said comparator means first input terminal for a given change in control voltage,

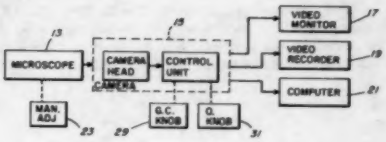
the difference between said comparator means input terminal voltages being a prescribed value when the control voltage is the reduced value, immediately following prior establishment of a control voltage that is just sufficient for making said comparator means change operating states in a manner that makes the output thereof change from the second to the first output voltage, for a prescribed DC reference current from which a change in current is to be measured, the prescribed value of difference voltage being a function of the magnitude of decrease in DC current that is to be detected.

4,412,246

METHOD OF ADJUSTING A VIDEO MICROSCOPE SYSTEM INCORPORATING POLARIZATION OR INTERFERENCE OPTICS FOR OPTIMUM IMAGING CONDITIONS

Robert D. Allen, and Nina S. Allen, both of Hanover, N.H., assignors to Hamamatsu Systems, Inc., Waltham, Mass.

Filed Jul. 13, 1981, Ser. No. 282,412
Int. Cl.³ H04N 7/18
U.S. Cl. 358—107 8 Claims



1. A method of adjusting a polarizing or interference type video microscope system for optimum imaging conditions, said video microscope system including a polarizing or interference type microscope for forming an optical image of a specimen, a video camera for forming a video image of the optical image and a video monitor for displaying the video image so formed, said microscope including an iris diaphragm and a compensator, said video camera including an adjustable gain control circuit and a DC restoration circuit having an adjustable clamp level, said method comprising:

a. adjusting the microscope for optimum optical imaging conditions as seen through the microscope with the gain and clamp level of the DC restoration circuit both at a minimum, said optimum optical imaging conditions including partly closing and iris diagragm and setting the compensator at approximately the same bias retardation as the specimen,

b. changing the compensator setting to within the range of around $\lambda/4$ to $\lambda/9$, and then

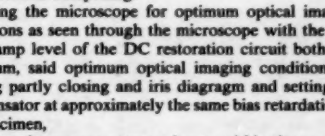
c. increasing the gain and changing the clamping level of the DC restoration circuit in the video camera for optimum video imaging conditions as seen on the video monitor.

4,412,247

X-RAY DIAGNOSTIC INSTALLATION COMPRISING AN IMAGE INTENSIFIER TELEVISION CHAIN

Heinz Horbaschek, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 22, 1981, Ser. No. 227,464
Claims priority, application Fed. Rep. of Germany, Feb. 11, 1980, 3004977; May 29, 1980, 3020464
Int. Cl.³ H04N 5/32
U.S. Cl. 358—111 9 Claims



1. An X-ray diagnostic installation, comprising an X-ray tube, an X-ray image intensifier, an optical coupler, a television pickup tube, a central unit for the control of the radiographic exposure values of the X-ray tube, a video amplifier coupled with the pickup tube for amplifying the image signal, switch

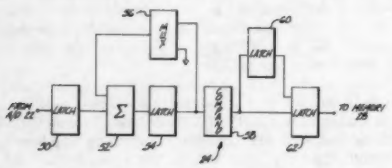
means, an image memory operable for storing an image-representing segment of the image signal under the control of the switch means and being controlled by the central unit, and a monitor, control means connected with the central unit and with the switch means and operable for actuating the switch means to control the selection of a segment of the image signal which is to be supplied from the video amplifier and stored by the image memory as a selected image, the central unit being operable to block the X-ray tube after completed exposure of the target of the television pickup tube, and the switch means being controlled by the control means in such a fashion that the storage of an image proceeds in each instance only after a number of scannings of the target of the television pickup tube, the control means being connected with the output of the video amplifier and controlling the switch means, in dependence upon the image signal, so as to effect storage when the maximum amplitude of the image signal falls below a specified value.

4,412,248

ULTRASONIC IMAGE STORAGE DEVICE AND METHOD

Ralph H. Carmen, Lebanon, N.J., assignor to Technicare Corporation, Solon, Ohio

Filed Jan. 11, 1982, Ser. No. 338,730
Int. Cl.³ H04N 7/18
U.S. Cl. 358—112 **15 Claims**



1. An ultrasonic imaging system for collecting and thereafter displaying body tissue images comprising:
an ultrasonic transducer;
input imaging means for converting signals received by said transducer to an analog video input signal;
means for producing a first series of digital amplitude samples representative of said video input signal;
means for forming a second series of digital amplitude samples from said first series, each element of said second series being an average of a group of elements from said first series;
means for storing and retrieving said second series of samples;
means for converting said retrieved samples to a video output signal substantially similar to said video input signal; and
display means responsive to said video output signal for producing an image of said tissue.

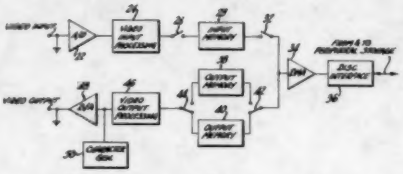
4,412,249

ULTRASONIC IMAGE STORAGE DEVICE AND METHOD

Ralph H. Carmen, Lebanon, N.J., assignor to Technicare Corporation, Solon, Ohio

Filed Jan. 11, 1982, Ser. No. 338,731
Int. Cl.³ H04N 7/18
U.S. Cl. 358—112 **15 Claims**

1. An ultrasonic imaging system for collecting and thereafter displaying body tissue images comprising:
an ultrasonic transducer;
input imaging means for converting signals received by said transducer to an analog video input signal;
means for producing a first digital signal representative of said video input signal;
means for companding said first digital signal to produce a second digital signal, said second digital signal being a first non-linear function of said first digital signal;
means for storing and retrieving said second digital signal;
means for decompanding a retrieved second digital signal to reconstitute said first digital signal;



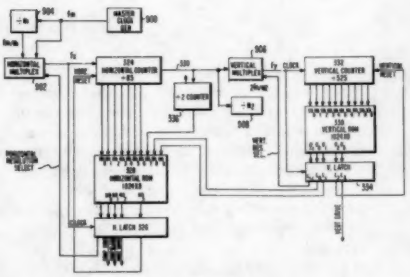
means responsive to said decompanding means for converting said first digital signal to a video output signal substantially similar to said video input signal; and
display means responsive to said video output signal for producing an image of said tissue.

4,412,250

MEMORY-TYPE SYNC GENERATOR WITH REDUCED MEMORY REQUIREMENTS

Terrence R. Smith, Clementon, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 24, 1981, Ser. No. 277,018
Int. Cl.³ H04N 5/06
U.S. Cl. 358—150 **1 Claim**



1. A television synchronizing signal generator comprising:
first memory means for storing information relating to the magnitude of at least one component of a composite synchronizing signal at each of a predetermined plurality of sample points in each television frame;
clock signal generating means coupled with said memory means for generating signals for recurrently addressing said memory means for reading said information from said memory sample by sample for generating said component signal;
the improvement comprising;
controllable rate controlling means coupled with said clock signal generating means and with said first memory means for controlling the instantaneous rate to a value other than zero at which said first memory means is addressed for controllably changing the rate at which said samples relating to the magnitude of at least one component of a composite sync signal are generated; and
second memory means coextensive with said first memory means and coupled with said first memory means for being addressed simultaneously therewith, said second memory means being adapted for being loaded with information relating to the rate at which said first memory means is addressed, said second memory means being coupled to a

rate control input terminal of said controllable rate controlling means for changing the rate of addressing of said first memory means during each field,

said controllable rate controlling means comprising a controllable counter, said controllable counter comprising,

a fixed counter coupled to said clock signal generating means for generating a divided clock signal; and

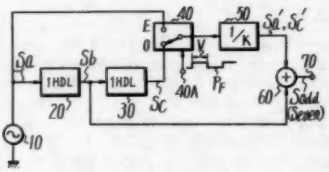
controllable multiplexing means coupled to said clock signal generating means and to said fixed counter for coupling to an output terminal thereof one of said divided clock signal and said clock signal in response to a control input, said control input being coupled to said second memory means for controlling said rate.

4,412,251

FLICKER PREVENTING CIRCUIT

Yutaka Tanaka, Yokohama, and Toshinobu Isobe, Tokyo, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 31, 1981, Ser. No. 298,106
Claims priority, application Japan, Sep. 2, 1980, 55-121539
Int. Cl.³ H04N *5/14*
U.S. Cl. 358—160 **7 Claims**



1. A flicker preventing circuit for a television receiver which displays interlaced even and odd video fields during successive field periods in response to an input video signal, each of said fields comprising a plurality of horizontal lines displayed during successive horizontal periods, said circuit comprising:

delay means receiving said input video signal and providing therefrom first and second delayed signals which are delayed by one horizontal period and by two horizontal periods, respectively, relative to said input video signal;

processing means receiving said input video signal and said first and second delayed signals and including means for alternatively delivering said input video signal and said second delayed signal during successive field periods, as a first output of said processing means, and delivering said first delayed signal as a second output of said processing means, with the level of said first output being different from the level of said second output; and

adding means for adding said first and second outputs of said processing means and providing a corresponding sum signal as the output of said flicker preventing circuit.

4,412,252

IMAGE REDUCTION SYSTEM

Robert S. Moore, Palo Alto, Calif., and Walter F. Wessel, III, Vestal, N.Y., assignors to NCR Corporation, Dayton, Ohio

Filed Jun. 1, 1981, Ser. No. 269,237
Int. Cl.³ H04N *1/02*
U.S. Cl. 358—160 **19 Claims**

1. Image reduction apparatus for deleting portions of image representations, comprising:

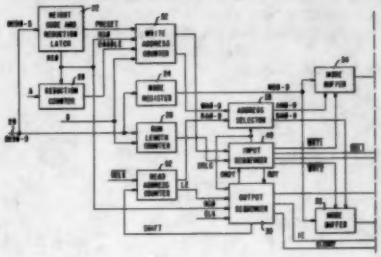
storage means for storage of information used to form an image;

output means coupled to said storage means for outputting image information to a utilizing device;

data input means for supplying data to be entered into said storage means;

data induction means for causing the selective elimination of data to produce a reduced data image representation;

first means controlled by said data reduction means to cause a selective first elimination of data during data storage in said storage means; and



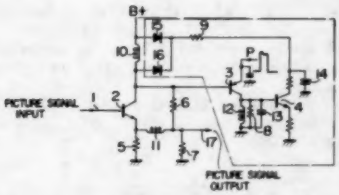
second means controlled by said data reduction means to cause a selective second elimination of data during transfer of data from said storage means to said output means.

4,412,253

AUTOMATIC NOISE REMOVAL DEVICE FOR A PICTURE SIGNAL

Masanori Oguino, Yokohama, Japan, assignor to Hatachi, Ltd., Tokyo, Japan

Filed Oct. 1, 1981, Ser. No. 307,583
Claims priority, application Japan, Oct. 4, 1980, 55-138245
Int. Cl.³ H04N *5/21*
U.S. Cl. 358—167 **10 Claims**



1. An automatic noise removal device for a picture signal comprising:

means for removing a high frequency component of a picture signal when the amplitude of said high frequency component is below a threshold level and for emphasizing said high frequency component when the amplitude thereof is not below said threshold level;

noise detecting means for detecting a noise component during part of a retrace interval of said picture signal;

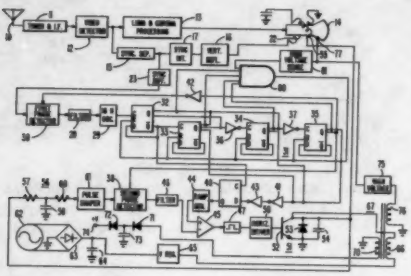
means for controlling said threshold level in accordance with the amplitude of the detected signal from said noise detecting means;

wherein when the detected signal from said noise detecting means is small, said threshold control means makes said threshold level substantially zero, and operation of said high frequency removing means is prevented, and when said detected signal is large, said threshold level becomes large and said high frequency component removal means removes a high frequency component contained in said picture signal when it is below said threshold level.

4,412,254
TELEVISION RECEIVER HIGH VOLTAGE PROTECTION CIRCUIT

Frank B. Lang, Princeton Junction, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jun. 24, 1981, Ser. No. 276,897
Int. Cl.³ H04N 5/68
U.S. Cl. 358—243 12 Claims



1. In a television receiver having a high frequency oscillator and a counter coupled to said oscillator incorporating a plurality of resettable counting means for providing a horizontal rate signal, means comprising:

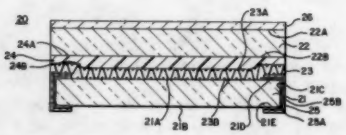
fault sensing means having an output for providing an indication of a receiver malfunction; and

resetting means coupled to said output of said fault sensing means and to said resettable counting means, and responsive to said malfunction indication for resetting said resettable counting means such that said counter provides a signal having a frequency different than said horizontal rate.

4,412,255
TRANSPARENT ELECTROMAGNETIC SHIELD AND METHOD OF MANUFACTURING

Bruce E. Kuhlman, and Marc A. Kamerling, both of Santa Rosa, Calif., assignors to Optical Coating Laboratory, Inc., Santa Rosa, Calif.

Filed Feb. 23, 1981, Ser. No. 237,367
Int. Cl.³ H04N 5/65
U.S. Cl. 358—245 15 Claims

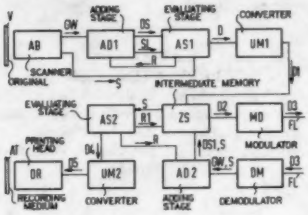


1. A transparent electromagnetic shield adapted for use on an information display device in electronic equipment comprising first and second transparent substrates each having major front and back surfaces with a front surface of one substrate adapted to be mated together with a back surface of the other, a conductive wire screen interposed between said first and second substrates in physical contact with one of said mating front and back surfaces thereof, and a single layer of polymer laminating material interposed between said screen and the other of said mating surfaces to bond said screen thereto, said layer of polymer laminating material filling the apertures in said screen and contacting portions of said one mating surface to bond said screen thereto and to bond said first and second substrates together.

4,412,256
METHOD AND APPARATUS FOR THE REPRESENTATION OF GRAY SCALE VALUES IN FACSIMILE TRANSMISSION

Joachim Heinzl, Munich, and Klaus P. von Borstel, Pullach, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 9, 1981, Ser. No. 281,868
Claims priority, application Fed. Rep. of Germany, Aug. 13, 1980, 3030648
Int. Cl.³ H04M 1/40
U.S. Cl. 358—283 12 Claims



1. A method for representing gray scale values in facsimile transmission wherein said gray scale values are represented on a recording medium by a plurality of printed dots of equal size, the number of said dots per unit area of recording medium being associated with a specific gray scale value, said method comprising the steps of:

scanning an original having graphic patterns thereon along a plurality of parallel lines;

generating a plurality of instantaneous gray scale value signals corresponding to gray scale values of the scanned graphic pattern;

adding said instantaneous gray scale values for each of a pre-determined number of scanned lines to arrive at a sum for each line;

storing said sums for each line;

adding a different constant value to said stored sums if said stored sums associated with each line are equal;

printing a dot on said recording medium for a particular line when the sum associated with said particular line reaches a pre-determined threshold value; and

decreasing the sum for said particular line after printing said dot by an amount corresponding to a black value of said gray scale.

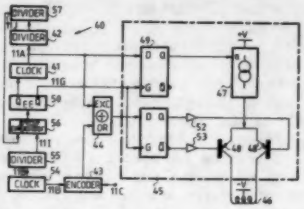
4,412,257
METHOD AND ARRANGEMENT FOR MAGNETIC DIGITAL RECORDING WITH HIGH FREQUENCY BIASING

Jean-Paul Lesieur, Massy, France, assignor to Compagnie Internationale pour l'Informatique Cii Honeywell Bull, Paris, France

Continuation of Ser. No. 156,368, Jun. 3, 1980. This application Jun. 11, 1982, Ser. No. 387,628
Claims priority, application France, Jun. 18, 1979, 79 15584
Int. Cl.³ G11B 5/09
U.S. Cl. 360—45 2 Claims

1. A circuit arrangement for magnetic recording of a digital data signal composed of a set of transitions comprising magnetic biasing means for delivering a high frequency, constant amplitude, original biasing signal and means for combining the said digital data signal with the said magnetic biasing signal so as to provide a recording signal, said combining means comprising a current switch device including a first and a second current switch connected to receive, respectively, complementary formats of the data signal, a recording winding connected to said first and second switches to produce the recording

signal, and a current source for each said current switch supplying the associated current switch and means for phase



modulating the original biasing signal relative to the data signal transitions.

4,412,258

MAGNETIC RECORDING AND PLAYBACK APPARATUS

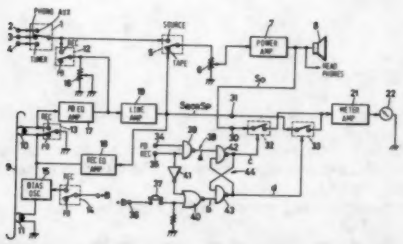
Shojiro Shimada, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Feb. 3, 1981, Ser. No. 231,052

Claims priority, application Japan, Feb. 6, 1980, 55-13244

Int. Cl.³ G11B *15/12, 15/04, 27/36*

U.S. Cl. 360—62 **14 Claims**



1. Magnetic recording and playback apparatus selectively changeable between a recording mode, a playback mode, and a stop mode, comprising level indicator means for indicating the strength of a signal applied thereto and operative, when said apparatus is in the recording mode, to indicate the strength of a signal to be recorded; power amplifying means having an input coupled to receive a played back signal and an output providing an amplified output signal; and switching circuit means for automatically coupling said level indicator means to the output of said power amplifying means when either of said stop mode and said playback mode is selected, including manually actuable means operative when said apparatus is in the playback mode for selectively connecting said level indicator means to the input of said power amplifying means, whereby the level indicator means can be selectively set to monitor the strength of the played back signal at the input of said power amplifying means when said apparatus is in its playback mode but is automatically returned to monitor the level at the output of the power amplifying means whenever said stop mode or said playback mode is again selected.

4,412,259

MAGNETIC RECORDING AND/OR REPRODUCING APPARATUS HAVING A ROTARY HEAD TRACKING CONTROL DEVICE

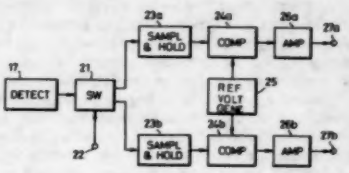
Seisuke Hiraguri, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed Feb. 17, 1981, Ser. No. 234,791

Claims priority, application Japan, Feb. 18, 1980, 55-18824

Int. Cl.³ G11B *21/10, 5/52*

U.S. Cl. 360—77 **9 Claims**



1. A magnetic recording and/or reproducing apparatus having a tracking control device for performing tracking control by varying the height position of a rotary head which makes contact with a magnetic tape over a predetermined angular portion of its rotating range to record and/or reproduce signals in oblique tracks on the magnetic tape and is out of contact with the magnetic tape over the remaining portion of its rotating range, according to a control signal applied to said tracking control device, said magnetic recording and/or reproducing apparatus comprising:

detecting means mounted in stationary relation with respect to the rotary head, for detecting the height position of said rotary head at a predetermined location where said rotary head is out of contact with said magnetic tape; and

control signal forming means for forming a control signal according to the output of said detecting means and supplying said control signal to said tracking control device to control the height position of said rotary head so that the height position becomes constant.

4,412,260

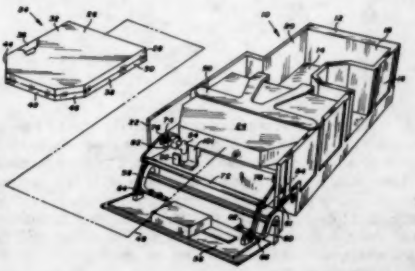
CARTRIDGE RECEIVER MECHANISM

John D. Stricklin; Anthony D. Denero; Robert A. Quatro, all of Oklahoma City, Okla., and James A. Duff, Omaha, Nebr., assignors to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Apr. 24, 1981, Ser. No. 257,086

Int. Cl.³ G11B *5/012*

U.S. Cl. 360—97 **14 Claims**



1. For mounting a disk cartridge in a disk drive, apparatus including:

a housing, and means defining an anterior opening through which a disk cartridge is insertable into the housing; a

spindle mounted in said housing and adapted to driveably engage a disk carried in said cartridge;

a receiver in said housing including a substantially rigid frame adapted to confine said cartridge, once inserted therein, to an attitude conforming to that of the frame;

an actuator means mounted for movement relative to said housing between open and closed positions, for moving said frame between extended and retracted positions corresponding to said open and closed positions, respectively, said frame in its extended position adapted to receive said cartridge inserted longitudinally inward through said opening and, when moved to its retracted position, to carry said disk to a driving engagement with the spindle;

a first connecting means for mounting said receiver frame to the housing and for restricting movement of said frame to transverse rotation and linear translation between anterior and posterior positions with respect to the housing;

a second connecting means for mounting said actuator means to the receiver frame and for restricting movement of said actuator means to transverse rotation and linear translation between first and second actuator positions relative to said frame; said first actuator and anterior positions corresponding to said open position, and said second actuator and posterior positions corresponding to said closed position; and

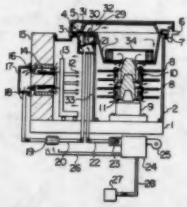
detent means, operative during pivoting of said actuator means inward from the open position toward the closed position, for maintaining said actuator means substantially in its first actuator position until said receiver is moved from the anterior position to the posterier position, thus to define an intermediate stage for said receiver frame between said extended and retracted positions, further inward movement of said actuator means to the closed position moving said actuator to its second position relative to the frame.

4,412,261

MAGNETIC DISK MEMORY DEVICE

Kenichi Tateyama, Odawara; Yasuo Matsumiya, Nakaimachi, and Toshio Hishinuma, Kanagawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 10, 1981, Ser. No. 252,816
Claims priority, application Japan, Apr. 16, 1980, 55-49234
Int. Cl.³ G11B *5/60, 5/40*
U.S. Cl. 360—98 **9 Claims**



1. A magnetic disc memory device having at least one disk pack including a plurality of magnetic disks and adapted to be driven rotatively, a magnetic head adapted to make recording and reproducting of information in and out of said magnetic disks, an access mechanism supporting said magnetic head and adapted to locate said magnetic head on the track in said magnetic disks, and an enclosure integrally enclosing said disk pack, magnetic head, and said access mechanism, said disk pack being removable;

said magnetic disk memory device comprising:

that said enclosure surrounds and encloses said disk pack and said access mechanism and provided with an opening through which said disk pack is changed with another disk pack;

a cover adapted to cover said opening of said enclosure and adapted to permit said opening to be opened as desired;

an air intake means for taking-in the external air through a filter;

an air passaage control means for receiving the cleaned air from said air intake means;

a first air passage connected at its one end to said air passage control means while the other end being opened to the inside of said enclosure to permit the air to be circulated between said air passage control means and the space inside said enclosure; and

a second air passage connected at its one end to said air passage control means and opened at its other end to a portion in the space within said enclosure different from the portion of the same to which said first air passage opens, thereby to permit said air to be circulated between said air passage control means and the space inside said enclosure;

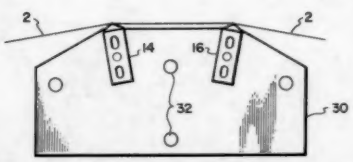
said air passage control means being operated in response to opening and closing motion of said cover in such a manner as to permit said air supplied from said air intake means to be circulated through said first air passage when said cover is in the opening position, and to permit, when said cover is in the closing position, the air delivered by a blower to be circulated through said second air passage and be recycled to said second air passage through said first air passage.

4,412,262

MOUNT FOR MAGNETIC RECORDER TRANSDUCER

Earl R. Schultz, Denver, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 29, 1981, Ser. No. 316,262
Int. Cl.³ G11B *21/24*
U.S. Cl. 360—109 **10 Claims**



1. A magnetic tape recorder apparatus having a transducer assembly, and mounting means for said transducer assembly, said mounting means comprising:

a fixed mounting bracket having a front surface and a rear surface;

adjustable cam means carried by said fixed mounting bracket having a cam element extending beyond said rear surface, said cam means being accessible for adjustment from said front of said bracket, said cam means including a screw structure and said mounting bracket having a threaded hole with said screw structure being threaded into said threaded opening to allow a rotation of said screw structure, said cam means further including a pin extending from one end of said screw structure with said pin being positioned eccentrically with respect to the axis of said screw structure,

said transducer assembly including a mounting block means on which one or more magnetic signal transducers are securely mounted;

said mounting block means having recess means arranged to cooperatively engage said pin extending from said cam element, and

securing means accessible from said front surface of said bracket for selectively securing said mounting block to said rear surface of said bracket;

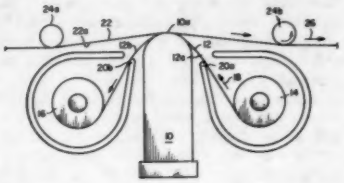
said cam means being adjustable to selectively select a position of said transducer assembly relative to said bracket.

4,412,263

RECORDING HEAD PROTECTIVE OVERLAY AND CLEANING ARRANGEMENT

Alfred M. Nelson, Redondo Beach, Calif.; Houshang Rasekhi, Convent Station, and Ronald J. Cieplik, Mountain Lakes, both of N.J., assignors to Wang Laboratories, Inc., Lowell, Mass.

Filed Aug. 5, 1981, Ser. No. 290,272
Int. Cl.³ G11B 5/41, 23/50
U.S. Cl. 360—128 15 Claims



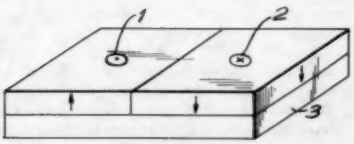
1. In a system in which at least the recording zone of a recording head is in intimate operative contact with a recording medium and substantially continuous relative movement is effected between the head and the medium, and a dielectric material is provided between the head and the medium, the protective arrangement comprising, first means for detecting a first condition of electrical conductivity between the head and the medium and second means responsive to said first means for effecting cessation of relative movement between such head and said medium when said first condition is detected.

4,412,264

MAGNETO-OPTIC RECORDING MEDIUM

Nobutake Imamura, Tokyo, and Chuichi Ota, Fuchu, both of Japan, assignors to Kokusai Denshin Denwa Co., Ltd., Tokyo, Japan

Filed Oct. 17, 1980, Ser. No. 197,805
Claims priority, application Japan, Oct. 22, 1979, 54-135123; Oct. 22, 1979, 54-135124
Int. Cl.³ G11B 11/10; G11C 11/42
U.S. Cl. 360—131 6 Claims



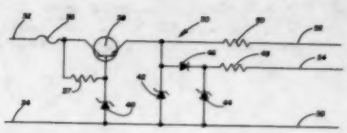
1. In a thin film magneto-optic recording medium on which two sorts of values are recorded by upward and downward magnetizations perpendicular to the film surface, the improvement wherein a tracking guide, which in use of said medium is followed by a magneto-optic recording/reproducing head, is defined on said medium by a region whose magnetization easy axis is perpendicular to the film surface and a region having no magnetization easy axis at least in the direction perpendicular to the film surface, said regions being located contiguously on the same surface.

4,412,265

INTRINSIC BARRIER

Frederick A. Buuck, Fort Wayne, Ind., assignor to Tokheim Corporation, Ft. Wayne, Ind.

Filed Nov. 27, 1981, Ser. No. 325,500
Int. Cl.³ H02H 3/20
U.S. Cl. 361—18 11 Claims



1. An intrinsic barrier comprising:
a first and second input lines for receiving input from an electrical source,
a first and second output lines for electrically connecting electronic circuitry that exists in a potentially explosive environment,
said second input line and said second output line forming a common lead,
a transistor having collector, base and emitter leads,
a fuse electrically connected between said first input line and the collector lead of said transistor,
a first zener diode interconnecting the base lead of said transistor and said common lead,
a first resistor electrically series connected in said first output line,
a voltage limiting means electrically interposed between the emitter lead of said transistor and said common lead; said voltage limiting means also being electrically interposed between said first output line and the emitter lead of said transistor,
said transistor and said first zener diode combining to function as a regulated voltage source to said first and said second output lines,
said first resistor being selected to limit the current in said first and said second output lines to a preselected maximum,
said voltage limiting means limiting the output voltage on said first and said second output lines only in the event that said first zener diode opens or a short occurs between the collector and the emitter leads of said transistor.

4,412,266

AC ELECTRICAL DEVICE PROTECTIVE THERMAL RELAY

Masahiko Niino, Nagoya, Japan, assignor to Yamada Electric Manufacturing Company Ltd., Nagoya, Japan

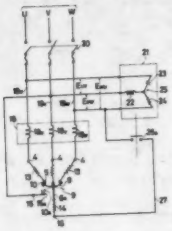
Continuation of Ser. No. 215,810, Dec. 12, 1980, abandoned.
This application Jul. 21, 1982, Ser. No. 400,448
Claims priority, application Japan, Jul. 2, 1980, 55-90359; Jul. 7, 1980, 55-92869
Int. Cl.³ H02H 7/085, 7/097
U.S. Cl. 361—24 2 Claims

1. In a three phase ac electric motor system comprising a three phase electric motor and a manual switch to control flow of current to said motor, the improvement of a protective device to protect said system against both motor overload and negative phase sequence, said protective device comprising:
a snap-action bimetallic switch of the normally closed circuit type connected in series with said motor,
a casing enclosing said bimetallic switch,
a main heater disposed in said casing adjacent said bimetallic switch, said heater being connected in series with said motor and said bimetallic switch so that when said bimetallic switch is heated above a predetermined temperature by an overload current through said motor said bimetallic switch will snap into an open circuit mode,

a PTC heater disposed in said casing adjacent to said bimetallic switch so that when said bimetallic switch is heated above said predetermined temperature by said PTC heater said bimetallic switch will snap into an open circuit mode,

a negative phase sequence detector electrically connected to said motor, said detector having an output switch of the normally open circuit type that is closed when said detector senses a negative phase sequence in said motor system,

said PTC heater being connected in series with said output switch to be energized to heat to above said predetermied temperature upon closing of said output switch and



circuit means to cause said PTC heater to continue to heat once said output switch closes as long as said abnormal condition continues comprising an auxiliary contact on said bimetallic switch that engages a fixed contact within said casing when said bimetallic switch snaps into said open circuit mode, said contacts being electrically connected in series with said PTC heater, and the power supply line of one of the three field windings of said three phase motor and said output switch is connected in series with said PTC heater and the power supply line of another of said three field windings of said three phase motor.

4,412,267

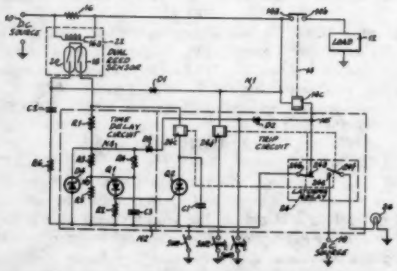
TIME-DELAY CURRENT SENSING CIRCUIT BREAKER RELAY

James E. Hansen, Oak Creek, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 119,055, Feb. 6, 1980, abandoned. This application Feb. 22, 1982, Ser. No. 350,790

Int. Cl.³ H02H *3/08, 3/093*

U.S. Cl. 361—94 **15 Claims**



1. A circuit breaker relay, comprising:

an electrical DC battery power supply source;

a load circuit including power switching means controllable to connect said source to a load;

a pilot switch operable to control said power switching means for energization and deenergization of said load;

current sensing means comprising normally open reed relay contact means operable to close for indicating that the current flowing in said load circuit has reached a predetermined level; and

circuit control means connected through said reed relay contact means to the power supply source side of said power switching means for opening said power switching means in response to said indication from said current sensing means that said current has reached said predetermined level;

said circuit control means comprising a time delay circuit and a trip circuit normally without supply power, said time delay circuit responding to closure of said contact means for precisely providing a predetermined time delay and then signaling said trip circuit, which in turn deenergizes said power switching means, disconnecting said load from said source;

and energy storage means connected to the power supply source side of said power switching means for supplying operating voltage through said reed relay contact means to said time delay circuit and said trip circuit in the event the voltage of said DC battery source should drop low on a high overload.

4,412,268

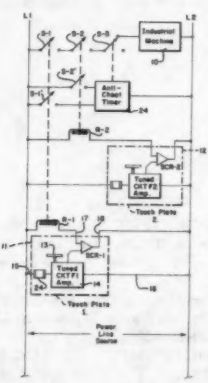
SAFETY SWITCH SYSTEM FOR INDUSTRIAL MACHINES

Edgar E. Dassow, West Bend, Wis., assignor to Dart Industries Inc., Northbrook, Ill.

Filed Oct. 2, 1981, Ser. No. 307,905

Int. Cl.³ H01H *9/00*

U.S. Cl. 361—181 **2 Claims**



1. A safety switch system for passing electrical power from a power source to an industrial machine, including, in combination:

(a) first and second touch plate switches physically positioned adjacent to the industrial machine to be energized thereby at a spacing from each other sufficient that both switches cannot be operated simultaneously with one hand of an operator but require both hands of the operator, each of said touch plate switches including an oscillating tuned circuit and amplifier; a touch plate connected to said oscillating tuned circuit, said oscillating tuned circuit being responsive to touching of the plate by an operator's hand to result in a signal change from said oscillating tuned circuit, said amplifier generating a trigger signal in response to said signal change, the frequency of the oscillating tuned circuit in said first touch plate switch being different from the frequency of said oscillating tuned circuit in the second touch plate switch; and a silicon controlled rectifier having its control terminal connected to receive said trigger signal;

(b) first and second relay switches connected in series with each other between said power source and machine;

(c) first and second relay coils respectively connected in circuit with the silicon control rectifiers of the first and second touch plate switches so as to be energized in response to firing of the silicon control rectifiers respectively whereby power cannot be passed to said industrial machine from said power source unless both said relay switches are closed and whereby operation of either one of said touch plate switches does not require any physical movement of the associated touch plate itself so that the risk of an operator developing carpal tunnel syndrome is substantially eliminated; and

(d) third and fourth relay switches connected to said first and second relay coils, respectively, to open and close simultaneously with the opening and closing of said first and second relay switches, respectively;

(e) an anti-cheat timer connected to said third and fourth relay switches to measure the time interval between the closing of said third and fourth relay switches; and

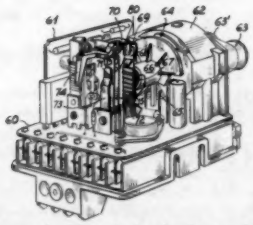
(f) a fifth relay switch connected in series with said first and second relay switches, said fifth relay switch also connected to said anti-cheat timer such that if the time interval between the closing of said third and fourth relay switches exceeds a predetermined amount said fifth relay switch is opened thereby opening the circuit to said industrial machine.

4,412,269

LOCK OUT MEANS IN IGNITION DEVICES FOR LIQUID FUEL BURNERS

Antonio Stella, and Giuseppe Canova, both of Legnago, Italy, assignors to R.B.L. Riello Bruciatori Legnago S.p.A., Legnago, Italy

Filed Feb. 12, 1981, Ser. No. 233,763
Claims priority, application Italy, Mar. 14, 1980, 20672 A/80
Int. Cl.³ F23Q *9/14*
U.S. Cl. 361—263 **7 Claims**



1. A fuel burner ignition device having an ignition transformer connected to electrodes, and having a lock out device comprising a thermal relay means and a resistive heating element for heating said relay means, said relay means controlling the flow of power to said ignition device and said heating element having a current flow which is directly related to a current flow to said electrodes;

wherein said thermal relay is arranged so as to receive at least a portion of said transformers electromagnetic flux, whereby said flux heats said thermal relay due to the parasitic current generated therein; and

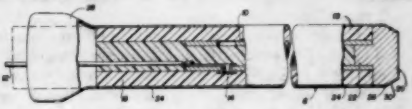
wherin said thermal relay is arranged so that said heating of said thermal relay by said flux at least partially compensates for variations in said heating of said thermal relay due to changes in said resistive heating element current flow which are due to changes in said current flow to said electrodes.

4,412,270

ELECTRODE ASSEMBLY FOR A CAPACITANCE TYPE PROBE

Paul G. Weitz, Jr., Salisbury, and Cecil Franklin, Middlebury, both of Vt., assignors to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Filed Jun. 25, 1981, Ser. No. 277,427
Int. Cl.³ G01F *23/26*
U.S. Cl. 361—284 **5 Claims**



1. An electrode assembly for use in a capacitance type probe for measuring the volume or height of electrically conductive liquids which comprises:

an inner conductive element, having an upper end and a bottom end;

a TEFLON coated electrical conductor secured in electrical contact with the upper end of said inner conductive element for conducting current from one to the other;

a thick-wall TEFLON tube pressed over the upper end of said inner conductive element with its bottom end even with said bottom end of said inner conductive element and the upper end extending above the upper end of said inner conductive element;

an end plug secured to the bottom end of said inner conductive element and said thick-wall TEFLON tube;

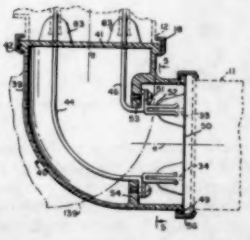
an outer TEFLON FEP sleeve coaxial with said inner conductive element and said thick-wall TEFLON tube, said outer TEFLON FEP sleeve extending around said end plug and above the upper end of said thick-wall TEFLON tube, said outer TEFLON FEP sleeve sealed to said end plug along its side and to said TEFLON coated electrical conductor at its upper end.

4,412,271

SUPPORT FOR FACILITATING READING OF AN ELECTRIC METER

Herbert C. Bailey, 12209 Hanover St., Sunnymead, Calif. 92388

Continuation of Ser. No. 78,178, Sep. 24, 1979, abandoned. This application Jul. 24, 1981, Ser. No. 286,692
Int. Cl.³ H02B *9/00*
U.S. Cl. 361—370 **5 Claims**



1. In combination, a socket type electric meter having an annular mounting flange encircling spaced terminals of a plurality of first electrical conductors, said meter being adapted to fit a conventional meter socket having an annular seating flange sized to congruently abut said mounting flange, which seating flange extends about a horizontal axis and encircles spaced terminals of a plurality of second electrical conductors which latter terminals engage the terminals of said plurality of first electrical conductors when the meter is mounted on the

socket for use, and meter support means particularly adapted for installation between said meter and said meter socket, said meter support means comprising:

a substantially hollow body characterized by the presence of a first annular flange extending about a first axis and sized to congruently abut the annular seating flange of said meter socket, and a second annular flange extending about a second axis disposed at an angle to said first axis and sized to congruently abut the annular mounting flange of said electric meter;

said meter support means including spaced terminals encircled by said first annular flange that are shaped and positioned for engagement with the spaced terminals of said plurality of second electrical conductors in either of two inverse positions about said horizontal axis, and spaced terminals encircled by said second annular flange that are shaped and positioned for engagement with the spaced terminals of said plurality of said first electrical conductors in either of two inverse positions of said meter about said second axis; and

conductive means directly interconnecting the spaced terminals encircled by said first annular flange with the spaced terminals encircled by said second annular flange in a way to permit conductive interconnection of said meter with said socket through said meter support means in either of two positions facing in different directions;

whereby said meter support means can be plugged into said socket in a first position and said meter attached thereto in right-side-up position to face in one of said two directions, or can be removed from said socket and reinserted therein in a position rotated 180 degrees from said first position whereat said meter can be removed therefrom, rotated through 180 degrees and reattached thereto to face in the other of the two directions in right-side-up position.

4,412,272

FLEXIBLE PRINTED CIRCUIT CARD ASSEMBLY

Larry D. Wedertz, Mira Loma, and Oakley G. Ross, Upland, both of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Aug. 31, 1981, Ser. No. 297,548
Int. Cl.³ H05K 7/20
U.S. Cl. 361—383 **14 Claims**

1. A flexible printed circuit card assembly comprising:

a strip of flexible insulating material having printed circuit conductor means thereon for accepting the leads of electronic components and embodying them into said circuit;

a sheet of insulating material positioned on said conductor means for covering said conductor means, said sheet having openings for accommodating the leads of electronic components extending into said printed circuit conductor means; and

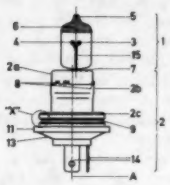
a cushioning layer of foam insulating and cushioning material having a plurality of air channels therein positioned on said sheet for covering electronic components when mounted on said sheet and connected to the printed circuit conductor means for electrically insulating and cushioning said components when said card is folded into a spiral.

4,412,273

HALOGEN INCANDESCENT LAMP WITH PART METAL, PART PLASTIC SOCKET, PARTICULARLY FOR AUTOMOTIVE HEADLIGHTS

Peter Helbig, Sontheim; Walter Schönherr, Giengen-Hürben, and Hermann Steiner, Herbrechtingen, all of Fed. Rep. of Germany, assignors to Patent-Treuhand-Gesellschaft für Elektrische Glühlampen mbH, Munich, Fed. Rep. of Germany

Filed Dec. 27, 1982, Ser. No. 453,491
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1982, 8201536[U]
Int. Cl.³ F21M 3/30
U.S. Cl. 362—211 **5 Claims**



1. Single-ended press-sealed halogen cycle incandescent lamp, particularly for use in automotive headlights and for combination with a reflector, having

a lamp bulb (**1**);

a lamp base (**2**) receiving said lamp bulb;

and terminal connectors (**14**) projecting from the lamp,

wherein, in accordance with the invention, the lamp base comprises

a generally cup-adjustment cap (*2a*) having a cylindrical portion, and made of metal;

a cylindrical sleeve (*2b*) made of metal and telescopically connected to the cylindrical portion of the adjustment cap;

and a plastic terminal element (*2c*) secured to the cylindrical sleeve,

the adjustment cap being formed with an opening (**7**) receiving the bulb (**1**), the diameters of the cylindrical portion and of said sleeve being matched to each other to provide for a snug fit between the sleeve and said cylindrical portion;

integrally formed welding flaps distributed about the circumference of the cylindrical portion and secured to one of said sleeves, and weld connections between said cylindrical portion and said sleeve at said welding flaps to provide for reliable secure welded connection of the cylindrical portion of the adjustment cap and the sleeve;

the plastic end portion (*2c*) comprising a ring-shaped element having an outer diameter substantially greater than the outer diameter of the cylindrical sleeve, secured to the cylindrical sleeve, and formed with a circumferential groove (**9**);

a sealing ring (**10**) received within the circumferential groove;

and an annular projecting flange (**11**) located beyond the sealing ring, at the site of the groove remote from the lamp, and terminating in a frusto-conical portion (**13**);

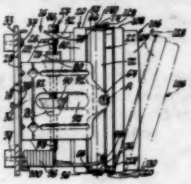
and wherein the connecting prongs (**14**) are secured to the frusto-conical portion and electrically connected to the bulb.

4,412,274

SUPPORT HOUSING FOR A VEHICLE HEADLAMP

David R. McMahan, Anderson, and Ronald O. Woodward, Muncie, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Dec. 17, 1982, Ser. No. 450,747
Int. Cl.³ F21V 21/26
U.S. Cl. 362—269 3 Claims



1. A support housing attachable to a vehicle body at the front end thereof and adapted to support and provide adjustable aiming movement of a headlamp about a pair of mutually perpendicular first and second pivot axes, said support housing including a bracket member comprising a vertically oriented mounting portion adapted to be secured to said vehicle body and a pair of laterally spaced arms fixed to said mounting portion, said arms extending horizontally outwardly from said mounting portion; a first ring member supported between said arms for pivotal movement about said first pivot axis, a second ring member located within said first ring member and supported by said first ring member for pivotal movement about said second pivot axis, said second ring member having a rearwardly extending section formed therewith, locator surfaces formed on said second ring member forwardly of said slot for engaging seating pads formed on the rear portion of said headlamp; a retainer member removably attached to said second ring member and surrounding the lens of said headlamp for maintaining said seating pads firmly in contact with said locator surfaces; a first adjustment screw located between said bracket member and said first ring member for adjusting the position of said headlamp about said first pivot axis, a second adjustment screw carried by said first ring member and having a nut threadably mounted on the shank portion of said second adjustment screw adjacent said rearwardly extending section of said second ring member and a pin and slot connection joining said nut to said rearwardly extending section so that upon rotation of said second adjustment screw said nut moves along said shank portion and said pin moves to different positions within said slot for adjusting the position of said headlamp about said second pivot axis, said first and second adjustment screws and said nut being located within the peripheral confines of said lens of said headlamp so as to provide a compact support housing.

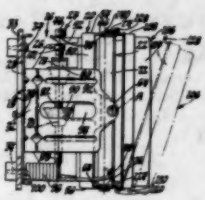
4,412,275

SUPPORT HOUSING FOR A VEHICLE HEADLAMP

David R. McMahan, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Dec. 17, 1982, Ser. No. 450,683
Int. Cl.³ F21V 21/26
U.S. Cl. 362—269 3 Claims

1. A support housing attachable to a vehicle body at the front end thereof and adapted to support and provide adjustable aiming movement of a headlamp about a pair of mutually perpendicular first and second pivot axes, said support housing including a bracket member comprising a mounting portion adapted to be secured to said vehicle body and a pair of laterally spaced arms fixed to the opposite end of said mounting portion, said arms extending horizontally outwardly from said mounting portion; a first ring member supported between said arms for pivotal movement about said first pivot axis, a second ring member located within said first ring member and being supported by said first ring member for pivotal movement about said second pivot axis, said second ring member having locator surfaces for engaging seating pads formed on the rear portion of said headlamp; a retainer member removably attched to said second ring member and surrounding the lens of said headlamp for maintaining said seating pads on said rear portion of said headlamp firmly in contact with said locator surfaces; a first adjustment screw located between said bracket



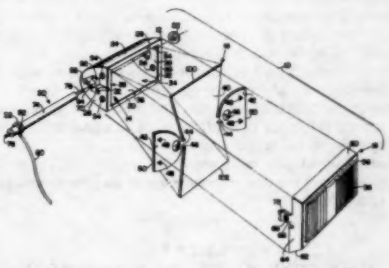
member and said first ring member for adjusting the position of said headlamp about said first pivot axis, and a second adjustment screw located between said first and second ring members for adjusting the position of said headlamp about said pivot axis, said first and second adjustment screws being located within the peripheral confines of the lens of said headlamp.

4,412,276

STROBE REFLECTOR ASSEMBLY

Igor Blinow, Millis, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Dec. 7, 1981, Ser. No. 327,920
Int. Cl.³ F21V 7/00
U.S. Cl. 362—278 5 Claims



1. A strobe lighting unit including a reflector having a generally concave predetermined shape, said lighting unit comprising:

a housing having an open ended cavity therein defined by surfaces which when engagingly contacted by reflective material support said material to form a reflector having said predetermined shape;

a thin, substantially planar blank of bendable light reflective material having an initial shape that is formed into said predetermined shape in response to pressing said blank into said cavity with a conforming die plunger and having residual tension forces induced therein, as a result of such formation, that urge said material into contact with said cavity surfaces to form said reflector when said shaped blank is retained in said cavity;

means, on said blank and housing, for temporarily holding said shaped blank in said cavity while the die plunger is withdrawn to prevent displacement of said shaped blank from said cavity;

means for retaining said shaped blank in said cavity, said retain-

ing means including a cover plate member being attachable to said housing for covering said open end of said cavity;

a light emitting strobe tube configured to be located at a predetermined position relative to said formed reflector; and

means for locating said strobe tube at its said predetermined position and retaining it thereat.

4,412,277

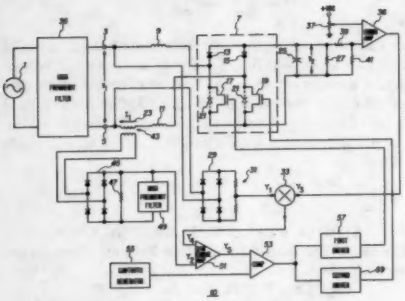
AC-DC CONVERTER HAVING AN IMPROVED POWER FACTOR

Daniel M. Mitchell, Cedar Rapids, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 3, 1982, Ser. No. 414,757

Int. Cl.³ H02P *13/00*

U.S. Cl. 363—81 **8 Claims**



1. A converter circuit for converting an AC signal to a DC signal comprising:

controllable converter means controlled by a control signal for controlling the phase and frequency of the current of the AC signal and the DC signal level;

first reference signal generator means for generating a first reference signal from the current of the AC signal;

second reference signal generator means for generating a second reference signal from the DC signal and the voltage of the AC signal; and

control signal generator means for generating the control signal from the first reference signal and the second reference signal.

4,412,278

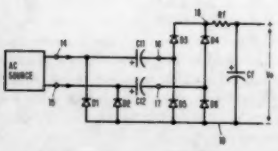
AC-TO-DC CONVERTER USING POLARIZED INPUT ISOLATION CAPACITORS

Graig S. Cambier, Louisville, and Lawrence P. Trubell, Longmont, both of Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 12, 1982, Ser. No. 338,927

Int. Cl.³ H02M *7/06*

U.S. Cl. 363—126 **3 Claims**



1. In a direct-current power supply operated from an alternating current source and having a pair of alternating current input terminal means for receiving input alternating current from said alternating current source and full-wave rectifier means for converting alternating current into full-wave pulsating direct current, said full-wave rectifier means having a pair of input terminal means for receiving alternating current and a pair of output terminal means for supplying pulsating direct current, the improvement comprising:

a pair of polarized input isolation capacitor means, having anode means and cathode means, each of said input capacitor means coupling a different one of said pair of alternating current input terminal means to a different one of said pair of input terminal means of said full-wave rectifier means; and

a pair of single-wave rectifier means, each coupled to conduct current between the same one of said pair of output terminal means of said full-wave rectifier means and a different one of said pair of alternating current input terminal means.

4,412,279

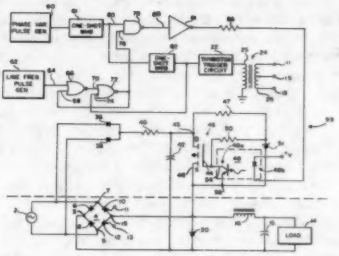
SWITCHING REGULATOR WITH TRANSIENT REDUCTION CIRCUIT

Robert C. Franklin, Los Gatos, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Dec. 28, 1981, Ser. No. 335,041

Int. Cl.³ H02M *7/155*

U.S. Cl. 363—128 **3 Claims**



1. In a switching voltage regulator including an AC voltage source, a full wave rectifier having its input terminals connected to the voltage source, a positive output terminal and negative output terminal connected to a load, and having a thyristor in each of two legs connected to the positive output terminal, an L-C filter including an inductor in series with the load and a first capacitor connected across the load, a commutating diode connected between the output terminals of the rectifier and across the L-C filter, and circuit means for activating the thyristors alternately over a predetermined period, the improvement comprising:

means synchronized to the circuit means for reverse biasing the commutating diode in advance of each activation of the thyristors.

4,412,280

COMPLEMENTARY COMMANDS IN FAIL-OPERATIONAL, FAIL-SAFE MULTI-COMPUTER CONTROL SYSTEM

Richard D. Murphy, Monroe, and Douglas H. Clelford, Shelton, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 938,583, Aug. 31, 1978, Pat. No. 4,270,168. This application May 19, 1980, Ser. No. 151,488

Int. Cl.³ G06F *15/46, 11/08, 15/16*

U.S. Cl. 364—200 **3 Claims**

1. A multiple computer process control system, in which each computer system comprises:

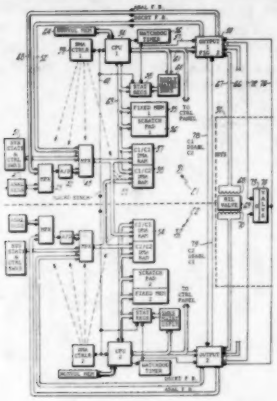
a plurality of inputs for providing signals for controlling said process;

a plurality of outputs corresponding to different functions to be controlled in said process;

feedback paths from said outputs to said inputs to provide feedback signals to said computer system indicative of the operation of said outputs;

a data link for providing data communication with a second one of said computer systems; and

program controlled means for performing a plurality of self tests indicative of the correct operation of said computer system and providing a self test failure signal in the event of failure of one of said self tests, for receiving signals from said inputs and providing calculated signals in response thereto related to said outputs, for providing command signals related to said calculated signals, for applying said command signals to corresponding ones of said outputs, for comparing the respective feedback signals provided by said feedback paths with corresponding ones of said com-



mand signals and providing a feedback failure signal corresponding to a related one of said outputs in the event of discrepancy between said command signals and said feedback signals corresponding to said related one of said outputs, for disabling any one of said outputs in response to a corresponding feedback failure signal, for disabling all of said outputs in response to a self test failure signal, for communicating said feedback failure signals to said second computer system, and for providing with respect to any one of said outputs which is disabled in said computer system, a zero-valued command signal to said output and a command signal equal to said calculated signal to said second computer system over said data link for comparison, in said second computer system, with a command signal equal to said calculated signal provided by said second computer system with respect to an output thereof corresponding to the output of said computer system which has been disabled.

4,412,281

DISTRIBUTED SIGNAL PROCESSING SYSTEM

George A. Works, Stow, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Jul. 11, 1980, Ser. No. 168,899

Int. Cl.³ G06F *11/20*

U.S. Cl. 364—200 **52 Claims**

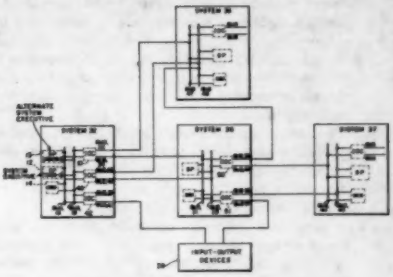
1. In combination:

a plurality of distributed signal processing systems;

each of said systems comprising a plurality of elements including a signal processor, a mass memory, and an input-output controller, and a first bus means for interconnecting in common said plurality of elements;

said input-output controller of each one of said systems comprising a second bus means for interconnecting a plurality of said systems by coupling said second bus means to said first bus means of another of said systems and for providing coupling to a plurality of input-output data devices; and

each of said elements comprising one or more bus transceivers and arbitration means coupled to one of said first and



second bus means for determining the one of a plurality of elements connected to said one of the first and second bus means that obtains first use of said connected one of the first and second bus means when more than one of said elements attempt to use one of said first and second bus means simultaneously.

4,412,282

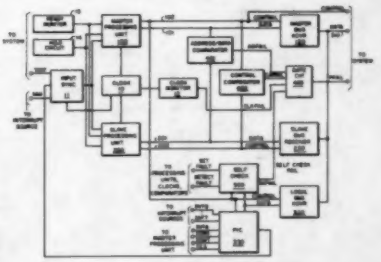
MICROPROCESSOR CONTROL CIRCUIT

James R. Holden, Chicago, Ill., assignor to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 29, 1980, Ser. No. 220,934

Int. Cl.³ G06F *7/00*; H04M *3/00*

U.S. Cl. 364—200 **12 Claims**



1. A processor control circuit for use in a computer system operated to generate an interrupt signal, said control circuit comprising:

a processing unit operated to generate a group of internal address, data and control signals;

a master bus transceiver connected to said processing unit;

a system data bus connected to said master bus transceiver;

said master bus transceiver operated in response to a first predetermined pattern of said internal address and control signals to transfer said internal data signals to said system data bus;

a local bus transceiver connected to said system data bus and said processing unit; and

an input-output device connected to said local bus transceiver and said processing unit;

said local bus transceiver operated in response to a second predetermined pattern of said internal address and control

signals to transfer data from said system data but to said local bus transceiver;

said input-output device operates in response to a third predetermined pattern of said internal address and control signals to transfer data from said local bus transceiver to said input-output device;

said input-output device further operated in response to a fourth predetermined pattern of said internal address and control signals to transfer data to said local bus transceiver;

said local bus transceiver operated in response to a fifth predetermined pattern of said internal address and control signals to transfer data from said input-output device to said system data bus;

said master bus transceiver operated in response to a sixth predetermined pattern of said internal address and control signals to transfer data from said system data bus to said processing unit;

said input-output device comprising

a programmable interrupt controller connected to said computer system and said processing unit, operated in response to said data from said local bus transceiver to arrange an interrupt recognition sequence; said programmable interrupt controller further operated in response to said interrupt signal to generate an interrupt received signal; said processing unit further operated in response to said interrupt received signal to generate an interrupt acknowledge signal; said programmable interrupt controller further operated in response to said interrupt acknowledge signal and said fourth pattern of internal address and control signals to transfer interrupt identification data to said local bus transceiver.

4,412,283

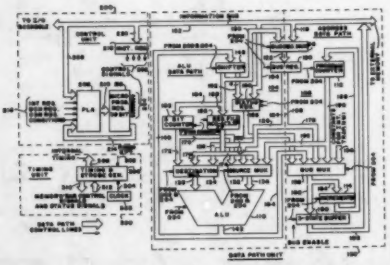
HIGH PERFORMANCE MICROPROCESSOR SYSTEM

Yeshayahu Mor, Santa Clara, and Dan Wilnai, Sunnyvale, both of Calif., assignors to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed May 30, 1980, Ser. No. 155,832

Int. Cl.³ G06F *7/48*

U.S. Cl. 364—200 **9 Claims**



1. In a microprocessor, a central processing unit which includes a data path unit comprising:

an address data path for operating on address information provided thereto and an arithmetic logic unit data path for operating on data information provided thereto, each of said data paths being capable of simultaneous operation during a clocked cycle, said data paths having

(i) a shared input multiplexer operatively connected to an information bus to receive address and data information therefrom and to said arithmetic logic unit data path to receive data information therefrom, said information bus being operatively connected to a control unit of said central processing unit for exchanging address and data information therewith; and

(ii) a shared bus register connected to receive address and data information from said input multiplexer, said bus register having means operatively connected thereto for transferring information from said bus register to said arithmetic logic unit data path, and

(iii) a shared output multiplexer operatively connected to said bus register to transfer address and data information from said bus register to said information bus, said bus register being usable as a memory data register, a memory address register or a temporary data register.

4,412,284

METHOD OF CONTROLLING AN APPARATUS, WHICH IS OPERATED BY A SOLID-STATE PROCESSOR AND POWERED BY AN ELECTRIC MAINS, IN CASE OF A POWER FAILURE AND APPARATUS EMPLOYING SAID METHOD

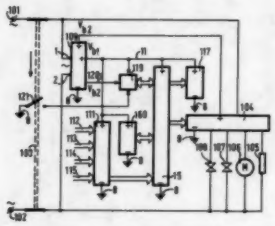
Jean-Francois Kerforne, Evreux; Jacques Le Gars, Pacy, and Michel Remery, Evreux, all of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 20, 1981, Ser. No. 245,824

Claims priority, application France, Mar. 21, 1980, 80 06414; Mar. 21, 1980, 80 06415

Int. Cl.³ G06F *11/00*

U.S. Cl. 364—200 **14 Claims**



1. A method of operating an apparatus by means of a solid state processor, which apparatus is powered by an electric mains and controlling, during a conditional operation, within a limited volume of space, at least one physical parameter through a predetermined range of values, which processor holds a plurality of selectable programmed routines, said method comprising the following subroutine steps which are activated by the machine in case of a power failure during execution of a selected routine,

(1) a power outage subroutine, comprising the steps of:

sensing the beginning of said power failure;

interrupting said selected routine;

enabling a timer means to start from an initial position;

saving identifier data associated with said selected routine, and indicating the point at which the interruption of said selected routine occurred;

(2) a power restoration subroutine comprising the steps of:

sensing the end of said power failure;

disabling said timer means and sensing its actual setting;

determining the duration of said power failure;

determining whether said duration exceeds a predetermined limit;

generating an "excess" signal if said duration exceeds said predetermined limit; generating a "non-excess" signal if said duration does not exceed said predetermined limit;

under control of an "excess" signal jumping to a termination subroutine;

under control of a "non-excess" signal proceeding with the power-restoration subroutine;

fetching said identifier data;

sensing the value of at least one physical parameter;

determining a reference value for said physical parameter at said point at which the interrption of said selected routine occurred;

comparing the value of said sensed physical parameter with

said determined reference value for said physical parameter, and determining whether said sensed physical parameter has a value lying within a predetermined tolerance from said reference value for said physical parameter;

generating an "acceptable" signal if said sensed physical parameter has a value lying within said predetermined tolerance; generating a "conditionally acceptable" signal if said sensed physical parameter has a value lying outside said predetermined tolerance;

under control of an "acceptable" signal restarting said interrupted routine;

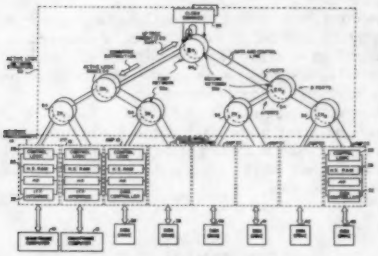
under control of a "conditionally acceptable" signal, determining from which point said interrupted routine has to be restarted in order to restore said parameter and proceed with said interrupted routine.

4,412,285

MULTIPROCESSOR INTERCOMMUNICATION SYSTEM AND METHOD

Philip M. Neches, Pasadena; David H. Hartke, Los Angeles; Richard C. Stockton; Martin C. Watson, both of Northridge; David Cronshaw, Torrance, and Jack E. Shemer, Los Angeles, all of Calif., assignors to Teradata Corporation, Inglewood, Calif.

Filed Apr. 1, 1981, Ser. No. 250,022
Int. Cl.³ G06F *15/16*
U.S. Cl. 364—200 **155 Claims**



1. A multiprocessor system comprising:

a plurality of processor modules, each including means for providing externally accessible semaphores evidencing readiness states of the procesor as to different transactions;

network means coupled to the processor modules for conducting a "test and set" operation as to the readiness states of the processors relating to a given transaction simultaneously in all processors, and selecting the least ready state as an indication of global readiness.

4,412,286

TIGHTLY COUPLED MULTIPLE INSTRUCTION MULTIPLE DATA COMPUTER SYSTEM

Brendan O'Dowd, 27 Foster Crescent, Knoxfield, Victoria, and Christopher Pitcher, 13 Orange Grove, Bayswater, Victoria, both of Australia

Continuation-in-part of Ser. No. 190,510, Sep. 25, 1980, abandoned. This application Mar. 23, 1981, Ser. No. 246,427
Int. Cl.³ G06F *7/02, 15/16*
U.S. Cl. 364—200 **40 Claims**

1. A multiple instruction multiple data system for concurrently processing data for a plurality of separate processes comprising:

(a) a first and second central processing unit,

(b) a first and second memory device,

(c) a bus,

(d) at least one of said first and second central processing units operable together with at least one of said first and second memory devices for executing at least a first and second of said plurality of separate processes,

(e) first and second interface means respectively connecting said first and second central processing units to said bus, and third and fourth interface means respectively connecting said first and second memory devices to said bus,

(f) said first interface means generating a first transaction code including a first process code identifying a first process to be executed by said first central processing unit and a first data field,

(g) said second interface means generating a second transaction code including a second process code identifying a second process to be executed by said second central processing unit and a second data field,

(h) said third interface means receiving said first and second transaction codes and including:

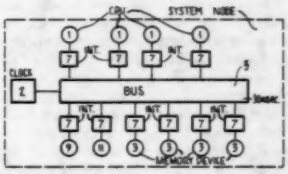
(1) means for storing an assigned process code,

(2) means for comparing said stored, assigned process code with said received first and second process codes and for generating a match signal when said stored, assigned process code is equal to one of said first and second process codes,

(3) means for receiving said first and second data fields, and

(4) means for feeding one of said received first and second data fields to said first memory device in response to said match signal, said first data field being fed when said stored, assigned process code is equal to said first process code, and said second data field being fed when said stored, assigned process code is equal to said second process code,

(i) said fourth interference means receiving said first and second transaction codes and including:



(1) means for storing an assigned process code,

(2) means for comparing said stored, assigned process code with said received first and second process codes and for generating a match signal when said stored, assigned process code is equal to one of said first and second process codes,

(3) means for receiving said first and second data fields, and

(4) means for feeding one of said received first and second data fields to said second memory device in response to said match signal, said first data field being fed when said stored, assigned process code is equal to said first process code, and said second data field being fed when said stored, assigned process code is equal to said second process code,

(j) means for assigning said first process code for storage in said third interface means,

(k) means for assigning said second process code for storage in said fourth interface means

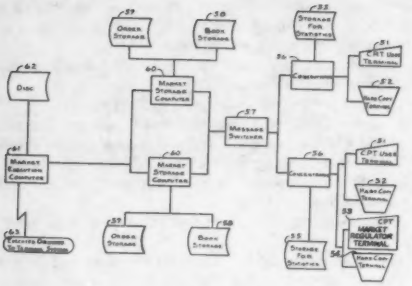
whereby said first central processing unit and said first memory device execute said first process and said second central processing unit and said second memory device concurrently executes said second process, and

(l) means for dynamically modifying said assigned first and second process codes whereby said first and second memory devices may be dynamically reassigned to the same or different process codes and thus to the same or different processes executed by said first and second central processing units.

4,412,287
AUTOMATED STOCK EXCHANGE

Walter D. Braddock, III, 70 W. Fairview, Springfield, Ill. 62707

Continuation of Ser. No. 581,840, May 29, 1975, abandoned.
This application Sep. 15, 1982, Ser. No. 418,297
Int. Cl.³ G06F 15/20, 15/24
U.S. Cl. 364—408 1 Claim



1. The method of operating a computer to process data records containing information about transactions in fungible goods, such as securities, which are produced by a data input device and generating an output display comprising the steps of:

(a) storing in a designated area all data records relating to each security,

(b) processing the data records relating to a first security in sequence in accordance with the following steps,

(c) sorting the data records into a first subset, each containing information including a customer identifier, an offer to buy, an associated price, and the number of shares of the security, hereinafter limit buy orders, in a priority sequence beginning with the highest price,

(d) sorting the data records into a second subset, each containing information including a customer identifier, an offer to sell, an associated price, and the number of shares of the security, hereinafter limit sell orders, in a priority sequence beginning with the lowest price,

(e) sorting the data records into a third subset, each containing information including a customer identifier, an offer to buy at the market, and an order time, hereinafter market buy order, in a priority sequence beginning with the earliest time,

(f) sorting the data records into a fourth subset, each containing information including a customer identifier, an offer to sell at the market, and an order time, hereinafter market sell orders, in a priority sequence beginning with the earliest time,

(g) sorting the data records into a fifth subset, each containing information including a customer identifier, an offer to buy at the market above a certain or stop buy price, hereinafter stop buy orders, into a priority sequence beginning with the lowest stop buy price,

(h) sorting the data into a sixth subset, each containing information including a customer identifier, an offer to sell at the market below a certain or stop sell price, hereinafter stop sell orders, into a priority sequence beginning with the highest stop sell price,

(i) storing within said designated area, in a seventh subset, a data record containing the price of the latest transaction of said security, hereinafter the last trade price,

(j) comparing each data record in said first subset with the record in said seventh subset to identify those records having a limit buy price above the last trade price,

(k) comparing each data record in said second subset with the record in said seventh subset to identify those records having a limit sell price below the last trade price,

(l) processing each such identified data record in said first subset in priority sequence against such identified records in said second subset at the last trade price, until the identified records of one subset are exhausted,

(m) merging said processed records into new records stored in an eighth subset of data records relating to said security, said records containing a puchaser identifier, a seller identifier, a transaction price and an identifier for the number of shares in the transaction,

(n) comparing each data record in said fifth and sixth subsets with said data record in said seventh subset to determine the stop buy orders at or below the last trade price and the stop sell orders at or above the last trade price and moving each such record to the end of the third and fourth subsets of data records,

(o) comparing each of the data records in said first and second subsets to identify either limit buy orders at or above the last trade price or limit sell orders at or below the last trade price,

(p) merging said identified records of limit order from said first or second subsets of data against opposed records of market orders at the last trade price and adding said new records to said eighth subset of data records, until the identified records in said first or second subset are exhausted,

(q) merging the records of market orders from said third and fourth subsets of data at the last trade price and adding said records to said eighth subset of data records, until the identified records in said third or fourth subset are exhausted,

(r) merging the remaining records of market orders from the unexhausted third or fourth subset of data against the records, in sequence of the records of limit orders of the second or first subset of data at the limit price until one of such subsets of records are exhausted,

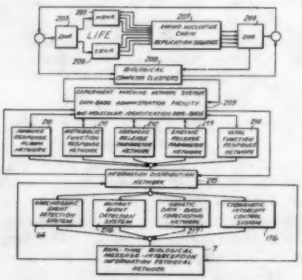
(s) comparing each such record added to the eighth subset with the record in the seventh subset to update the value of the last trade, according to the result of the comparison,

(t) transferring control to process the data records relating to the next security.

4,412,288
EXPERIMENT-MACHINE

Michael Herman, 3059 Brighton 5th St., Brooklyn, N.Y. 11235

Filed Apr. 1, 1980, Ser. No. 136,326
Int. Cl.³ A61B 5/00
U.S. Cl. 364—413 38 Claims



1. A biological diagnostic and testing system comprising:

probe means for examining intra-cellular activity within an individual cell in animal tissue in vivo and selectively providing a physical indication signal representing that activity;

control means for selectively actuating said probe means to provide said physical indication signal; and

display means for providing a visual display in real time of the intra-cellular activity represented by said physical indication signal.

4,412,289

RECONSTRUCTION METHOD OF X-RAY COMPUTED TOMOGRAPHY

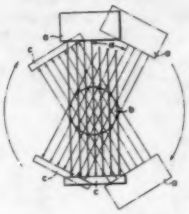
Shoichiro Yamaguchi, and Fujio Kobayashi, both of Tokyo, Japan, assignors to The President of Tokyo Institute of Technology, Tokyo, Japan

Filed Jan. 23, 1981, Ser. No. 227,683

Claims priority, application Japan, Feb. 13, 1980, 55-16340; Mar. 4, 1980, 55-27168; Mar. 7, 1980, 55-29446; Mar. 7, 1980, 55-29447

Int. Cl.³ G06F *15/42*; G01T *1/20*

U.S. Cl. 364—414 12 Claims



1. A method of constructing a computed tomogram of the internal structure of an object analyzed by X-rays comprising, emitting toward an object being analyzed in a common direction relative to an imaginary reference direction and in a common tomographic plane a plurality of substantially parallel X-ray beams equally spaced from each other laterally, detecting and measuring the density of the individual X-ray beams at separate corresponding spaced points downstream of the object after traversing of the X-ray beams through said object and developing in dependence upon the measured density of said plurality of X-ray beams signals representative of and corresponding to the density of the individual X-ray beams measured, subsequently emitting toward said object from a different common direction relative to said reference direction in said common tomographic plane a second plurality of substantially parallel X-ray beams laterally equally spaced from each other and intersecting at individual regions in said object paths traversed by the first-mentioned plurality of X-ray beams, the areas of intersection having a matrix pattern, detecting and measuring the X-ray beam density of said second plurality individually at separate corresponding spaced points downstream of the object after the traversing of said beams through said object, developing signals in dependence upon the measured density of said individual second plurality of X-ray beams, calculating the absorption coefficient of each of the individual areas of the tomographic plane where the X-ray beam paths intersect with reference to said measured beam densities, each beam being no wider than the corresponding individual area of path intersections and for which the absorption coefficients are calculated, developing signals corresponding to calculated absorption coefficients, constructing with said signals a tomogram depicting an image of the internal structure of the object scanned and analyzed by said X-ray beams.

4,412,290

ELECTRONIC CONTROL DEVICE FOR CHANGING THE SPEED RATIOS IN AN AUTOMATIC TRANSMISSION OF AN AUTOMOTIVE VEHICLE

Gerard Pannier, Bois d'Arcy, France, assignor to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

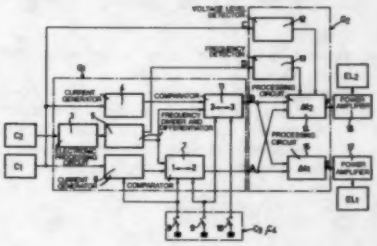
Filed Jul. 22, 1980, Ser. No. 171,092

Claims priority, application France, Jul. 24, 1979, 79 19104

Int. Cl.³ G05D *17/02*; G06G *7/64*; B60K *41/08*

U.S. Cl. 364—424.1 28 Claims

1. An electronic governor for an electronic control system which changes the speed ratios in an automatic transmission of an automotive vehicle having first, second, and third forward ratios with shifting under torque and one reverse mode, said transmission being controlled by a hydraulic circuit with electrically actuated control valves dependent on information relating to the operation of the vehicle and in particular on signal corresponding to: (1) the load on the motor as indicated by the position of the accelerator pedal, (2) the speed of the vehicle, (3) the position of a manual control member imposing certain transmission ratios and (4) an end-of-course retrocontact of the accelerator pedal, said electronic governor receiving the above information and supplying to a sequential commutator means a first signal for shifting from the first forward transmission ratio to the second ratio and vice versa, a second signal for shifting from the second ratio to the third ratio and vice versa, and a third signal whose frequency corresponds to the speed of the vehicle, said sequential commutator means upon receiving said signals supplying control signals for actuating said electrically actuated control valves, said electronic governor comprising



first time-interval comparator means for supplying said first signal for the control of shifting from the first transmission ratio to the second ratio and vice versa,

second time-interval comparator means for supplying the second signal for the control of the shifting from the second transmission ratio to the third ratio and vice versa,

each said comparator means comparing the length of the period of the signal corresponding to the speed of the vehicle with the duration of the signal corresponding to the load on the motor,

first current generator means connected to said switch and receiving the signal corresponding to the motor load and for sending an output signal to said first said comparator means, and

second current generator means connected to the signal corresponding to the motor load and sending an output signal to the second said comparator means.

4,412,291

BRAKE TORQUE CONTROL SYSTEM

Robert L. Amberg, and Thomas J. Gaseor, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sep. 30, 1980, Ser. No. 192,248

Int. Cl.³ B60T *8/00*; G06G *7/70*

U.S. Cl. 364—426 15 Claims

1. A brake torque control system for limiting torque developed during braking of a braked wheel, comprising:

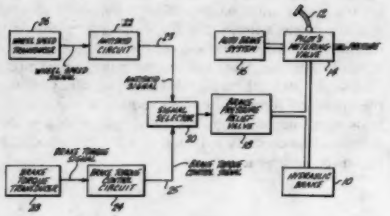
transducer means responsive to brake torque to provide a brake torque signal representative of the magnitude of the torque developed at the braked wheel;

means for providing a reference torque signal representative of a predetermined maximum brake torque;

means for comparing said brake torque signal with said reference torque signal to provide an error signal representative of the difference between said brake torque and said predetermined maximum brake torque;

a torque limiting circuit including an integrator, propor-

tional gain means, and a differentiator, said integrator operating to integrate said error signal to provide an output signal representative at the integral of said error signal, said proportional gain means operating in response to an error signal having a polarity representative of a brake torque greater than said predetermined maximum brake torque to provide an output signal substantially proportional to said error signal, said differentiator operating to provide an output signal representative of the derivative of said error signal;



summing means for additively combining said output signals of said integrator, said proportional gain means, and said differentiator to provide a brake torque control signal; and

means responsive to said brake torque control signal for reducing brake force in response to said brake torque control signal.

4,412,292

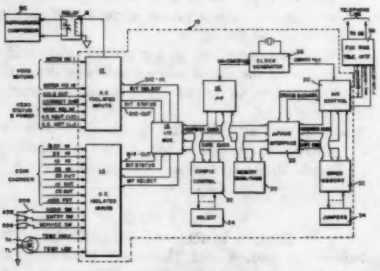
SYSTEM FOR THE REMOTE MONITORING OF VENDING MACHINES

Jason K. Sedam; James V. M. Hale, both of Dunwoody; Stewart W. Caldwell, Marietta, all of Ga.; Willard T. Bushman, Palm Bay, and Richard A. Wright, Melbourne, both of Fla., assignors to The Coca-Cola Company, Atlanta, Ga.

Filed Feb. 17, 1981, Ser. No. 235,122

Int. Cl.[3] G06F *15/20*; G07F *11/00*; H04M *11/04*

U.S. Cl. 364—479 **11 Claims**



1. A system for the remote monitoring of sensors in a vending machine and for automatically communicating the condition of said sensors to a central computer complex comprising:

a plurality of storage compartments for containing products to be vended;

door means in said vending machine providing access to said storage compartments;

door switch means for sensing when said door is open and generating a door open signal;

entry acknowledge switch means within said vending machine which is inaccessible until said door means is opened, said entry acknowledge switch means generating a legal entry signal when actuated within a predetermined period of time after the generation of said door open signal;

timer means for measuring said predetermined period of time after the generation of said door open signal;

logic circuit means for sensing if said entry acknowledge switch means is actuated during said predetermined period of time;

alarm generating means coupled to said logic circuit means for transmitting an illegal entry alarm signal to said central computer complex if said entry acknowledge switch is not actuated within said predetermined period of time;

service switch means for generating a service signal in response to the manual actuation thereof indicative of an entry into said vending machine to service the same; and

means for generating and transmitting a service alarm signal to said central computer complex in response to the occurrence of said service signal in combination with said legal entry signal.

4,412,293

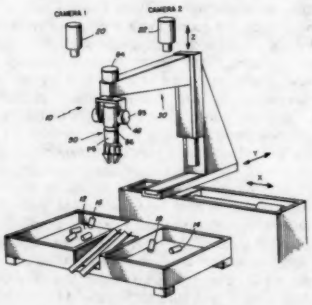
ROBOT SYSTEM WHICH ACQUIRES CYLINDRICAL WORKPIECES FROM BINS

Robert B. Kelley, 69 Linden Dr., Kingston, R.I. 02881; John R. Birk, 8 Spruce Ct., Peace Dale, R.I. 02879; Henrique Martins, University of Rhode Island, J-11 Old Graduate Student Apts., Kingston, R.I. 02881, and Richard P. Tella, Valley Dr., Ashaway, R.I. 02804

Filed Mar. 30, 1981, Ser. No. 248,784

Int. Cl.[3] G06F *15/46*

U.S. Cl. 364—513 **26 Claims**



16. A method of acquiring unoriented workpieces from a bin using a clamping-type hand, the workpieces being structurally distinct from a sensing system which collects data at least some of the pieces having arbitrary orientation angles in three rotational degrees of freedom which includes:

(a) collecting data about the unoriented workpieces in a bin by a sensing system, the data sufficient to select a holdsite for such a hand on workpieces having arbitrary orientation angles;

(b) determining and selecting holdsites on workpieces in a bin;

(c) locating a selected holdsite relative to the hand of a robot assembly, the robot assembly including an arm to position and rotate the hand;

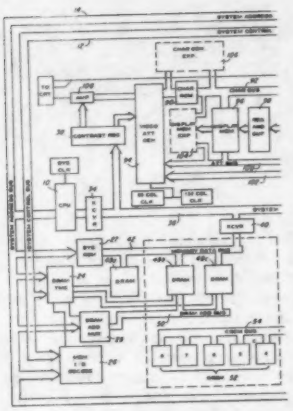
(d) moving the hand having clamping fingers to engage the selected holdsite; and,

(e) engaging the workpiece with the fingers.

4,412,294
DISPLAY SYSTEM WITH MULTIPLE SCROLLING REGIONS

LaVaughn F. Watts; Ronald L. Smith; Yogendra C. Pandya, and Paul B. Wood, all of Houston, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 23, 1981, Ser. No. 237,316
Int. Cl.³ G06F 3/14
U.S. Cl. 364—518 7 Claims



1. A data display system for forming a plurality of independently controllable display regions on a display device comprising:

data processor means;

input means for transmitting electronic signals to said processor means;

main memory means connected to said processor means for receiving data therefrom and for providing data and instructions thereto;

mass data storage means having processor instructions permanently stored therein for transferring selected instructions to said memory means for subsequent transfer to said processor means as required;

control means for controlling the transfer of instructions from said mass data storage means to said main memory means;

a display device;

display controller means;

display memory means connected to and accessed by said controller means for storing information to be outputted to said display device;

character memory means connected to said controller means and to said display memory means for storing a set of predetermined character codes;

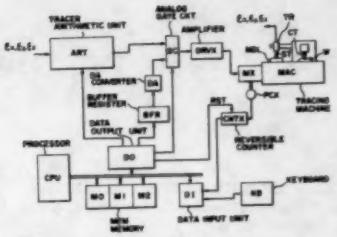
generator means connected to said display controller means, to said character memory means and to said display memory means for outputting signals to said display device; and

random access memory means connected to said display controller means and to said generator means for storing alterable character code information, wherein said random access memory means is accessed by said display controller means through said generator means.

4,412,295
TRACER CONTROL EQUIPMENT

Ryoji Imazeki, and Etsuo Yamazaki, both of Hachioji, Japan, assignors to Fujitsu Fanuc Limited, Tokyo, Japan

Continuation of Ser. No. 141,794, Apr. 18, 1980, abandoned. This application Mar. 29, 1982, Ser. No. 362,667
Claims priority, application Japan, Oct. 24, 1978, 53-130836
Int. Cl.³ G06F 15/46; G05B 19/42
U.S. Cl. 364—520 6 Claims



1. A tracer control device which calculates a trace direction and a trace velocity for tracing control using displacement signals from a tracer head tracing the surface of a model and a predetermined desired value for a composite displacement signal, and which performs the tracing control for tracing the model by moving the tracer head selectively along a plurality of machine axes of said device in accordance with the calculated trace direction and trace velocity values, said device comprising:

a memory for storing predetermined numerical command data in digital form for providing selective numerical control of the position of said tracer head apart from said tracing control;

an analog gate circuit including means for being selectively operated for said tracing control and for said numerical control of the position of said tracer head, and having outputs for selectively driving said tracer head along said machine axes of said device for tracing control and for said numerical control of the position of the tracer head; and

control means, including a processor, for determining whether said tracing control or said numerical control of the position of the tracer head is to be performed, for selectively reading out the numerical command data from the memory, and for performing said numerical control of the position of the tracer head in accordance with the selected numerical command data;

wherein said control means comprises:

means for selectively operating said analog gate circuit for said tracing of said model and for said numerical control of the position of the tracer head;

a buffer register in which the processor sets digital data corresponding to a direction and velocity of the motion of the tracer head according to the selected numerical command data for performing said numerical control of the position of the tracer head;

A D-A converter for converting said digital data set in the buffer register to a respective analog signal, and to provide each said analog signal to said analog gate circuit to selectively drive said tracer head along said machine axes for performing said numerical control of the position of said tracer head;

a plurality of servo motors and respectively coupled position detectors, for providing motion of said tracer head along the respective machine axes of the tracer control device for said numerical control of the position of the tracer head, and means for driving each said servo motor according to each respective analog signal as a velocity command signal, each said position detector

providing output pulses corresponding to the distance moved along respective machine axes; and

a respective reversible counter for counting the output of each said position detector;

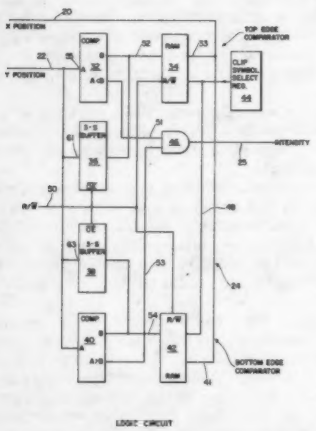
wherein said control means selectively reads the count content of each said respective reversible counter for comparing the count content with respective numerical command data stored in the memory, for providing said numerical control of the position of the tracer head.

4,412,296

GRAPHICS CLIPPING CIRCUIT

Stephen P. Taylor, Dunedin, Fla., assignor to Smiths Industries, Inc., Clearwater, Fla.

Filed Jun. 10, 1981, Ser. No. 272,408
Int. Cl.³ G06F *3/153*
U.S. Cl. 364—521 **5 Claims**



LOGIC CIRCUIT

1. In a system for clipping graphic symbols on a CRT, within preselected linear or curvilinear clipping boundaries, a logic circuit for controlling CRT intensity, the logic circuit comprising:

input terminals at which first and second coordinate positional data regarding graphic symbols are presented;

memory means for storing a look-up table enabling correlation between first coordinates of points for corresponding second coordinate addresses, of preselected linear and curvilinear clipping boundaries;

comparator means connected at its input to the input terminals and the memory means for comparing an instantaneous first positional coordinate of the symbol at the input terminals with the coordinates in memory; and

gating means, connected at its input to the output of the comparator means, for generating a

(a) first intensity signal at the output thereof when a symbol point, at a moment of time, is located within a clipping boundary and

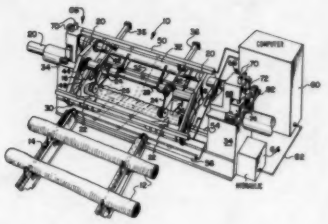
(b) second intensity signal at the output thereof when a symbol point is located outside a clipping boundary.

4,412,297

ULTRASONIC LOG SCANNING AND ORIENTATION SYSTEM

Darrell N. Halgrimson, Edmonds; Donald H. Hanson, Arlington, and Richard T. King, Mountlake Terrace, all of Wash., assignors to Black Clawson, Inc., Evertt, Wash.

Filed Oct. 6, 1980, Ser. No. 193,980
Int. Cl.³ B27B *1/00*
U.S. Cl. 364—559 **14 Claims**



1. In a device for orienting a log with respect to the axis of rotation of a veneer lathe prior to supplying the log to the veneer lathe, including support means for supporting a log, positioning means for adjusting the position of said support means, transducer means for sensing the position of a log supported by said support means to determine the orientation of the log for optimum operation of said veneer lathe, and control means, responsive to said transducer means, for controlling said positioning means to orient the log with respect to the axis of rotation of said veneer lathe, the improvement wherein said transducer means comprises;

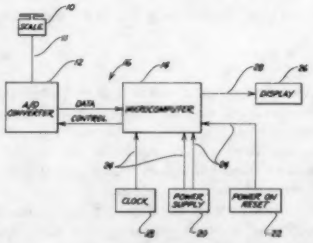
a plurality of groups of ultrasonic transducers, said groups being spaced apart along the length of the log, and each such group including a plurality of ultrasonic transducers positioned circumferentially about said log for sensing the surface of the log at points spaced circumferentially thereabout.

4,412,298

METHOD FOR TRACKING CREEP AND DRIFT IN A DIGITAL SCALE UNDER FULL LOAD

Seymour Feinland, and Arthur Rubinstein, both of Stamford, Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Sep. 20, 1979, Ser. No. 77,468
Int. Cl.³ G01G *23/14, 19/413*
U.S. Cl. 364—567 **7 Claims**



1. A method for tracking creep and drift in an electronic scale during the period when a load remains on the scale, comprising:

(a) continuously updating the tare weight of the scale prior to placing said load on the scale;

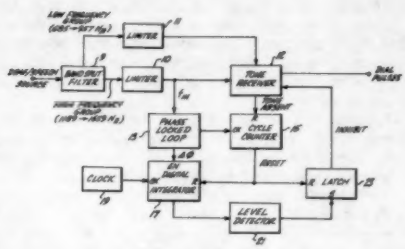
(b) placing a load on the scale;

(c) storing the current tare weight recorded at the time the load is placed upon the scale;
(d) storing the gross weight of the load;
(e) tracking the variance in the gross weight as a result of creep and drift; and
(f) updating the stored tare weight by adding thereto the variance in the gross weight while the load remains on the scale.

4,412,299
PHASE JITTER DETECTOR

Joseph K. Huffman, Kirkland, Wash., assignor to Teltone Corporation, Kirkland, Wash.

Filed Feb. 2, 1981, Ser. No. 230,689
Int. Cl.³ G01R *23/12*; H04M *1/26, 1/00*
U.S. Cl. 364—570 **40 Claims**



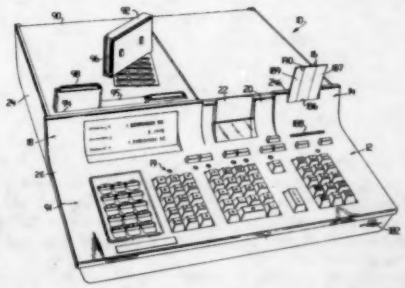
1. A phase jitter detector for determining the phase jitter of an incoming signal comprising:
(A) squaring means for receiving and squaring the wave shape of said incoming signal; and,
(B) electronic circuit means coupled to said squaring means for determining the phase jitter of said incoming signal by: (i) determining the phase difference between each cycle of the squared incoming signal and the average frequency of the squared incoming signal over a predetermined number of preceeding cycles of the incoming signal; and, (ii) combining said phase difference information and said predetermined number of cycles information to determine the phase jitter of said incoming signal, said electronic circuit means including:
(1) phase determining means coupled to said squaring means for determining the phase difference between each cycle of the squared incoming signal and the average frequency of the preceeding cycles of said squared incoming signal and producing an output signal containing said phase difference information;
(2) cycle counting means incremented at a rate related to the frequency of said incoming signal; and,
(3) digital integrating means coupled to said phase determining means and to said cycle counting means for integrating the output of said phase determining means containing said phase difference information over a predetermined number of cycles of said incoming signal counted by said counting means, said integrated output signal information defining the phase jitter of said incoming signal over the predetermined number of cycles counted by said cycle counting means.

30. A signal-to-noise ratio measuring system comprising:
(A) a squaring circuit for receiving and squaring the wave shape of the signal whose signal-to-noise ratio is to be measured;
(B) electronic circuit means coupled to said squaring means for measuring the signal-to-noise ratio of said incoming signal by: (i) determining the phase difference between each cycle of the squared incoming signal and the average frequency of the squared incoming signal over a predetermined number of preceeding cycles of the incoming signal; (i) combining said phase difference information and said predetermined number of cycles information to determine the phase jitter of said incoming signal; and, (iii) converting said phase jitter into signal-to-noise ratio form, said electronic circuit means including:
(1) phase determining means connected to the output of said squaring means for determining the phase difference between each cycle of the signal whose signal-to-noise ratio is to be determined and the average frequency of the preceeding cycles of said signal and producing a related phase difference output signal;
(2) cycle counting means for counting at a rate related to the frequency of said incoming signal;
(3) signal detecting means connected to the output of said squaring means for detecting the presence of the signal whose signal-to-noise ratio is to be determined, said signal detecting means connected to said cycle counting means for inhibiting the operation of said cycle counting means until said signal detecting means detects the presence of the signal whose signal-to-noise ratio is to be measured; and,
(4) digital integrating means connected to said phase determining means for integrating the phase difference output signal of said phase determining means and to said cycle counting means for being reset when said cycle counting means reaches a predetermined level; and,
(C) display means connected to the output of said digital integrating means for displaying the output of said digital integrating means just prior to said digital integrating means being reset by said cycle counting means, said display representing the signal-to-noise ratio of the signal whose signal-to-noise ratio is to measured.

4,412,300
PROGRAMMABLE CALCULATOR INCLUDING ALPHABETIC OUTPUT CAPABILITY

Robert E. Watson; Jack M. Walden, and Charles W. Near, all of Loveland, Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 43,780, May 31, 1979, abandoned, which is a continuation of Ser. No. 848,686, Nov. 4, 1977, abandoned, which is a division of Ser. No. 535,750, Dec. 23, 1974, Pat. No. 4,063,221, which is a division of Ser. No. 153,437, Jun. 15, 1971, Pat. No. 3,859,635. This application Feb. 6, 1981, Ser. No. 232,088
Int. Cl.³ G06F *3/02*
U.S. Cl. 364—709 **9 Claims**



1. An electronic calculator comprising:
a keyboard input unit for entering information into the calculator, said keyboard input unit being normally operative for entering numeric data into the calculator and for initiating other nonalphabetic functions to be performed by the calculator;
a basic first memory unit, coupled to the keyboard input unit, into which information may be written and from which information may be read;

a basic second memory unit for storing routines and/or subroutines to be executed by the calculator in performing selected functions;

one or more additional second memory units, adapted to be removably plugged into the calculator, for storing routines and/or subroutines to be executed by the calculator in performing additional selected functions, thereby increasing the number of functions that may be performed by the calculator;

processing means, coupled to the keyboard input unit, basic first and second memory units, and additional second memory units, the processing means being responsive to information from the keyboard input unit or the basic first memory unit and to operating states within the calculator itself for selectively executing one or more of the routines and/or subroutines stored in the basic second memory unit or in any of the additional second memory units plugged into the calculator to perform one or more of the selected functions employing information from one or both of the keyboard input and basic first memory units; and

an output printer unit, coupled to the processing means, for providing an output indication of the selected functions performed by the calculator, said output printer unit being operative for printing out a complete set of alphabetic and numeric characters and other symbols;

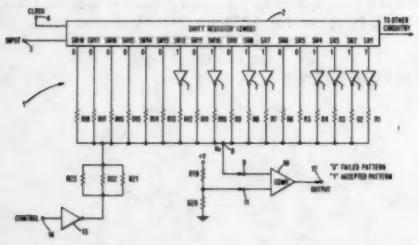
said processing means being responsive to routines and/or subroutines stored in one of said additional second memory units for enabling a plurality of nonalphabetic keys of said keyboard input unit to be redefined as alphabetic keys and for enabling printing by the output printer unit of alphabetic and numeric characters and other symbols individually and in the form of messages.

4,412,301

DIGITAL DATA CORRELATOR

W. Douglas Strabeck, Norwood, Mass., assignor to GTE Products Corporation, Stamford, Conn.

Filed Jun. 8, 1981, Ser. No. 271,737
Int. Cl.³ G06F *15/34*; G06J *1/00*
U.S. Cl. 364—728 **7 Claims**



1. A digital data correlator for detecting the presence of a predetermined binary code word in a data stream, said code word comprising a predetermined combination of bits of first and second possible logic values, said digital data correlator comprising:

storage means arranged to receive and store therein bits of a data stream and having a plurality of outputs at which the bits stored in the storage means are presented, each of said outputs being at the same value of impedance irrespective of the logic value of the bit presented to the output;

linear circuit means coupled to the outputs of the storage means and operative whenever bits presented to the outputs of the storage means have values other than those expected when a coded word having the predetermined combination of bits is present at the outputs of the storage means to produce an analog error voltage having a value linearly related to the number of erroneous bits, said error voltage being independent of the position of the erroneous bits in the storage means;

wherein the linear circuit means comprises:

a plurality of inverter means coupled to selected ones of the outputs of the storage means and corresponding to bits of one of the two possible logic values expected to be present at the selected outputs when a code word having the predetermined combination of bits is present in the storage means and at the outputs of the storage means, each of said inverter means being operative to invert the logic value of the bit presented to the corresponding output of the storage means; and

a plurality of like-valued resistance means coupled to the plurality of inverter means, to the outputs of the storage means and to a common point coupled to the comparator means, said plurality of like-valued resistance means being operative in conjunction with the inverter means to establish and provide to the common point to the comparator means an analog error voltage whenever bits presented to the outputs of the storage means have values other than those expected when a code word having the predetermined combination of bits is present in the storage means at the outputs of the storage means; and

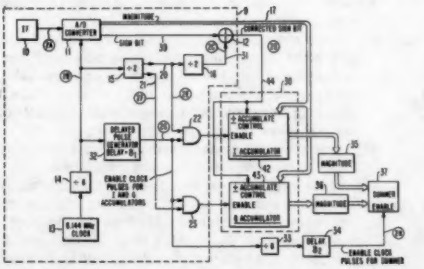
comparator means coupled to the linear circuit means and operative to compare the value of each error voltage produced by the linear circuit means against a reference voltage having a value related to a predetermined number of erroneous bits and to produce an output of a first value indicative of an accepted code word when the compared voltages bear a predetermined first relationship to each other and to produce an output of a second value indicative of a non-accepted code word when the compared voltages bear a predetermined second relationship to each other.

4,412,302

DIGITAL PHASE DEMODULATION AND CORRELATION

Edward J. Nossen, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 15, 1980, Ser. No. 216,167
Int. Cl.³ G06F *15/34*
U.S. Cl. 364—728 **12 Claims**



1. A system for digital detection of the energy content of a received analog signal of frequency f_c and comprising:

sampling means including sampling signals for obtaining digitized samplings of said analog signal at sampling rate 4 f_c with successive samplings being defined alternately as I and Q samplings and spaced apart 90° relative to the phase of said received analog signal, and with each of said digitized samplings having a magnitude component and a sign component;

first means responsive to said sampling means to produce first and second quadrature two level timing control signals each having a frequency 2 f_c with the level transitions of said first quadrature signal occurring at each sampling

signal, to produce a two level polarity control signal of frequency f_c with the transitions occurring at every alternate sampling, and to produce clock pulses having a repetition rate 4 f_c and occurring between the level transitions defining each half cycle of one of said two level timing control signals;

multiplier means responsive to said sign component of said digitized samplings and said two level polarity control signal to produce a corrected sign bit signal;

and

first logic means comprising first and second accumulator means for accumulating, when enabled, the magnitude components of said I and Q samplings, respectively, in accordance with the polarity of the said corrected sign bit signal of each of said samplings; and

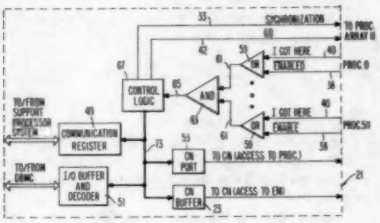
second logic means for enabling said first and second accumulator means upon the concurrence of a given level of said first and second two level timing control signals, respectively, and a clock pulse.

4,412,303

ARRAY PROCESSOR ARCHITECTURE

George H. Barnes; Stephen F. Lundstrom, both of Wayne, and Philip E. Shafer, Holmes, all of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 26, 1979, Ser. No. 97,191
Int. Cl.³ G06F *15/16, 15/20*
U.S. Cl. 364—900 **8 Claims**



1. An array processing system interfacing with a host processor for performing I/O functions and a file memory, said array processing system comprising:

data base buffer memory means having at least one data transfer channel connected to the file memory under control of the support processor for rapid transfer of information therethrough, said data base memory means receiving parallel processing jobs from the file memory and returning to the file memory the processed resultants of the jobs received, said parallel processing jobs including both programs for vector and scalar processing and related data;

an array of parallel memory modules connected via a second data transfer channel to said data base memory means, each memory module in said array storing data from said data base memory means during processing by said array processing system;

an array of parallel processor means, each processor means being programmable for independently processing data fetched approximately in parallel from individual memory modules, each processor means having indicator means for indicating when a future operation must be initiated in parallel with at least one other processor means for indicating when it is ready to begin said future operation;

connection network means interposing said array of parallel memory modules and said array of parallel processor means, said connection network means providing a plurality of data communication paths between said array of parallel memory modules and said array of parallel processor means wherein each provided data communications path in said plurality thereof is provided to a requested individual memory module from a requesting individual processor means; and

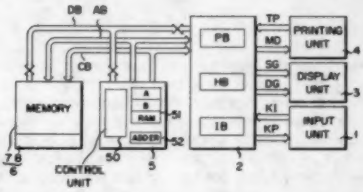
coordinator means connected to each processor means for monitoring each said indicator means for indicating when a future operation must be initiated in parallel with at least one other processor means and for inhibiting each processor means so indicating from initiating said future operation until each processor means so indicating is also indicating that it is ready to begin it's future operation.

4,412,304

ELECTRONIC CASH REGISTER

Tooru Yamakita, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Sep. 3, 1980, Ser. No. 183,630
Claims priority, application Japan, Sep. 10, 1979, 54-115937
Int. Cl.³ G06F *3/12, 3/02*
U.S. Cl. 364—900 **2 Claims**



1. In an electronic cash register, the improvement comprising the combination of:

a keyboard for having entry keys for inputting sales data and particular data date;

a central processing unit coupled to said keyboard for processing input sales data;

current date memory means coupled to said central processing unit for storing current dates;

particular date memory means coupled to said central processing unit for storing a plurality of particular dates written in by way of operation of said keyboard;

message storing means for storing messages corresponding to said particular dates;

said central processing unit including:

a first register means for receiving current date data from said current date memory means and a second register means for receiving a particular date data from said particular date memory means;

means for reading out said current date from said first register means in response to an operation of said keyboard to produce a sales receipt;

means for reading out a particular date sequentially from said second register means;

comparing means for sequentially determining whether the particular date read from said second register means is a particular date following the current date read out from said first register means everytime a particular date is read from said second register means; and

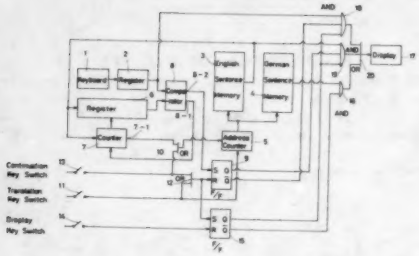
means for extracting only those particular dates following the current date which is read out from said first register means; and

printing means coupled to said central processing unit for issuing a sales receipt and for printing on the sales receipt the current date read out of said first register means, calculated sales data, at least one of the particular dates following said current date and at least one message, previously stored in said message storing means, corresponding to said at least one of said particular dates printed on the sales receipt.

4,412,305
SENTENCE TRANSLATION DEVICE

Kunio Yoshida, Nara, Japan, assignor to 501 Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 7, 1980, Ser. No. 204,924
Claims priority, application Japan, Nov. 12, 1979, 54-146935
Int. Cl.³ G06F *15/38*
U.S. Cl. 364—900 **14 Claims**



1. An electronic language translator for use in translating any of a certain plurality of groups of words from a first language into a second language, the translator comprising:

an input means for entering and storing a selected word from a chosen group of words corresponding to one of the certain plurality of groups of words in the first language;

a first memory means for storing data representing each of the plurality of groups of words in the first language;

an address means responsive to the input means for addressing the first memory means to cause sequential retrieval of each of the plurality of groups of words stored in the first memory means;

a detection means connected to the first memory means and responsive to the addressing of the first memory means by the address means for detecting equivalency between the selected word stored in the input means and any word of any one of the plurality of groups of words retrieved from the first memory means;

a second memory means for storing data representing a second and like plurality of groups of words in the second language, each of the second groups of words being the translation of one of the groups in the first language and being correspondingly addressed within the second memory means as is its counterpart in the first memory means, the second memory means being simultaneously addressed along with the first memory means by the address means such that upon a detection of equivalency by the detection means, the corresponding, translated group of words in the second language is retrieved; and

a display means responsive to the detection means for displaying the corresponding, translated group of words in the second language that has been retrieved from the second memory means whereby translation of a group of words from the first language to the second language can be accomplished by inputting only a single word selected from the group of words in the first language.

4,412,306
SYSTEM FOR MINIMIZING SPACE REQUIREMENTS FOR STORAGE AND TRANSMISSION OF DIGITAL SIGNALS

Edward W. Moll, 7A W. Bluebell La., Mt. Laurel, N.J. 08054

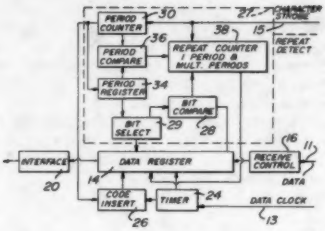
Filed May 14, 1981, Ser. No. 263,570
Int. Cl.³ G06F *7/02*
U.S. Cl. 364—900 **5 Claims**

1. A system for minimizing the storage or transmission of digital information signals, comprising:

(a) data register means for storing said digital information signals at locations in timed relationship with each other corresponding to the order of receipt of said digital signals,

(b) means including a repeat logic circuit for detecting repetition of digital information signals substantially the same as previously transmitted digital signals;

(c) means for detecting the start and length of said repetition relating to said digital signals;



(d) means for deriving a digital repeat code including data relating to the start and length of said repetition when said repetition of said digital signals is detected;

(e) means for inserting said repeat code in said data register means to provide encoded data in locations time related to said digital signals previously stored therein;

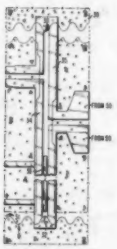
(f) utilization means, and

(g) means for transferring said encoded data from said data register means to said utilization means.

4,412,307
MAGNETIC BUBBLE DETECTOR

David T. Ekholm, Bethlehem Township, Hunterdon County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 24, 1981, Ser. No. 305,129
Int. Cl.³ G11C *19/08*
U.S. Cl. 365—8 **6 Claims**

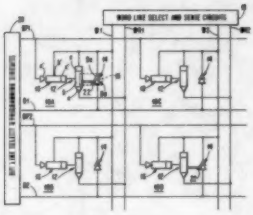


1. A magnetic bubble memory comprising a layer of material in which magnetic bubbles can be moved along at least a first path having spaced-apart first and second positions, a detection element extending from said first position along an axis aligned laterally with respect to the axis of said path and terminating short of said second position, first and second electrical conductors extending between said first and second positions, and means for selectively applying to said first and second conductors current pulses in a manner and for a time to first stretch a bubble in said first position along said detection element to said second position and thereafter to destretch said bubble from said detection element leaving said bubble at said second position.

4,412,308
PROGRAMMABLE BIPOLAR STRUCTURES

David L. Bergeron, Winooski, Vt., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 15, 1981, Ser. No. 273,520
Int. Cl.³ G11C 17/06
U.S. Cl. 365—105 39 Claims



1. A switchable structure comprising;

a rectifying contact disposed on an N type semiconductor substrate forming a Schottky diode between said contact and said substrate,

a P type diffusion region disposed in said substrate and spaced within a minority carrier diffusion length from said rectifying contact,

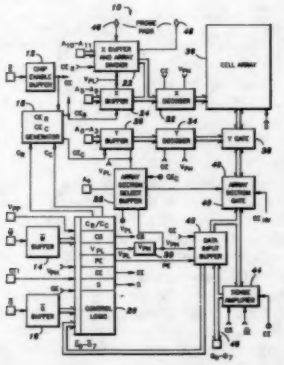
means for applying a potential to said region more positive than the potential at said contact, and

means for applying a reverse bias between said rectifying contact and said N type substrate to produce a conductive filament between said contact and said region.

4,412,309
EEPROM WITH BULK ZERO PROGRAM CAPABILITY

Clinton C. K. Kuo, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 28, 1981, Ser. No. 306,119
Int. Cl.³ G11C 11/40
U.S. Cl. 365—184 6 Claims



1. An electrically erasable programmable read only memory (EEPROM) comprising:

an array of memory elements arranged with one of said memory elements at the intersection of each of a plurality of row lines and column lines of said array, said memory elements characterized as assuming relatively high threshold voltage states in response to a selectively applied voltage having a first predetermined polarity, and a relatively low threshold voltage state in response to a selectively applied voltage having a second predetermined polarity; and

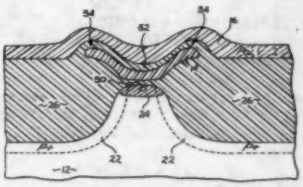
circuit means for applying, in response to an array program input signal, to all of the memory elements in said array a voltage having said second predetermined polarity; whereby

all of said memory elements assume the relatively low threshold voltage state.

4,412,310
EPROM CELL WITH REDUCED PROGRAMMING VOLTAGE AND METHOD OF FABRICATION

George J. Korsh, Redwood City; Mark A. Holler, Milpitas; George Perlegos, Fremont, and Paolo Gargini, Palo Alto, all of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Oct. 14, 1980, Ser. No. 196,838
Int. Cl.³ G11C 11/40
U.S. Cl. 365—185 10 Claims



1. In an electrically programmable, MOS memory cell, having a pair of spaced-apart regions in a substrate which define a channel region, a floating gate member insulated from and disposed above said channel region, and a control gate member insulated from and disposed above said floating gate member, an improvement in said cell wherein:

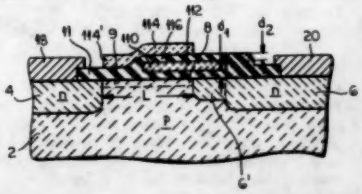
the insulation between said floating gate member and said control gate member is thicker at the edges of said floating gate member than in the central portion of said floating gate member;

wherein a thinner insulation may be used between said floating gate member and said control gate member without having uncontrolled removal of charge from said floating gate member, thereby permitting the programming of said cell at a lower potential.

4,412,311
STORAGE CELL FOR NONVOLATILE ELECTRICALLY ALTERABLE MEMORY

Franco Miccoli, Ravenna, and Giuseppe Corda, Saronno, both of Italy, assignors to SGS-Ates Componenti Elettronici S.p.A., Agrate Briazna, Italy

Filed Jun. 3, 1981, Ser. No. 269,814
Claims priority, application Italy, Jun. 4, 1980, 22538 A/80
Int. Cl.³ G11C 11/40
U.S. Cl. 365—185 7 Claims



1. A storage cell for a nonvolatile electrically alterable memory, comprising:

a semiconductor substrate of p-type conductivity provided

at a surface thereof with n-doped source and drain areas sepaarated by a channel region;

a dielectric layer on said surface spanning said channel region and adjacent parts of said source and drain areas;

a floating gate of conductive material imbedded in said dielectric layer above a portion of said drain area and an adjacent section of said channel region, said floatng gate leaving uncovered another section of said channel region adjoining said source area;

a control gate of conductive material on said dielectric layer extending above and not beyond said channel region between said source and drain areas while terminating above the boundaries of said areas and overlapping only a portion of said floating gate; and

circuit means connected to said drain area and to said control gate for enabling the application of selected writing, reading and cancellation voltages thereto.

4,412,312

MULTIADDRESSABLE HIGHLY INTEGRATED SEMICONDUCTOR STORAGE

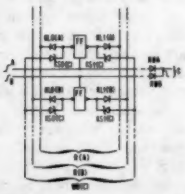
Horst H. Berger, Sindelfingen, and Siegfried K. Wiedmann, Stuttgart, both of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 2, 1981, Ser. No. 317,045

Claims priority, application European Pat. Off., Nov. 26, 1980, 80 10 7368.5

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—189 **8 Claims**



1. A multiaddressable storage comprising a plurality of intersecting bit and word lines forming crosspoints therebetween, a plurality of storage locations provided at the crosspoints and connected to said respective bit and word lines, said storage locations each consisting of at least a cell pair of two storage elements, and coupling elements for connecting the storage elements to associated bit lines differing from each other and to separate word lines, whereby each storage location is provided with at least three independently selectable read/write ports.

4,412,313

RANDOM ACCESS MEMORY SYSTEM HAVING HIGH-SPEED SERIAL DATA PATHS

Bryan D. Ackland, East Windsor, and Neil H. E. Weste, Eatontown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 19, 1981, Ser. No. 226,462

Int. Cl.³ G11C *7/00, 8/00*

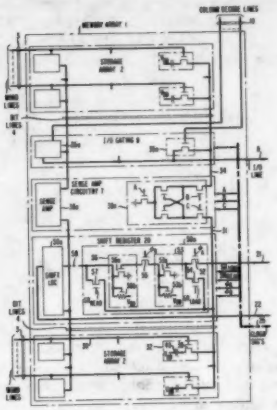
U.S. Cl. 365—221 **11 Claims**

1. A random access memory having a storage array of memory elements arranged in rows and columns, comprising

a plurality of bit lines arranged such that each bit line runs parallel to a respective one of the columns and is connected to at least individual ones of the memory elements in said respective one of the columns,

shift register means directly connected to at least individual ones of said bit lines and positioned within said random access memory substantially at the midpoint of said array, and

means responsive to address signals applied to said memory for transferring bit signals between each of said bit lines and addressed ones of the memory elements in said row and for



transferring said bit signals between said bit lines and said shift register means.

4,412,314

SEMICONDUCTOR MEMORY FOR USE IN CONJUNCTION WITH ERROR DETECTION AND CORRECTION CIRCUIT

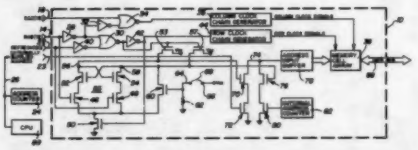
Robert J. Proebsting, Dallas, Tex., assignor to Mostek Corporation, Carrollton, Tex.

PCT No. PCT/US80/00672, § 371 Date Jun. 2, 1980, § 102(e) Date Jun. 2, 1980, PCT Pub. No. WO81/03568, PCT Pub. Date Dec. 10, 1981

PCT Filed Jun. 2, 1980, Ser. No. 292,122

Int. Cl.³ G11C *7/00*

U.S. Cl. 365—222 **4 Claims**



1. In a semiconductor dynamic memory wherein a memory cell is accessed through row and column lines at a memory address in conjunction with a row address strobe (RAS) signal and a column address strobe (CAS) signal, the memory address stored in an address buffer, the RAS signal generating row clock signals which access and refresh the memory cells on the row corresponding to the memory address in the address buffer, the CAS signal generating column clock signals for connecting the addressed memory cell to a data bus, a circuit for enhancing the refresh of the memory cells and for enhancing error detection and correction, comprising:

a terminal for receiving a refresh signal;

an internal address counter for generating memory addresses;

means for optionally connecting first and second internal terminals;

means for generating said row clock signals upon receipt of said refresh signal;

means for inhibiting the generation of said column clock signals in the absence of said RAS signal; and

means for transferring the memory address in said address

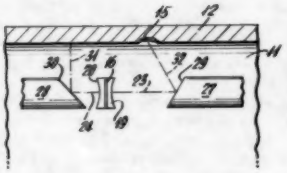
counter to said address buffer when said means for connecting is in the first state and said refresh signal is received in the absence of said RAS signal and for transferring an externally supplied memory address to said address buffer when said means for connecting is in a second state, and either said RAS signal or said refresh signal or said RAS signal and said refresh signal are received.

4,412,315

ACOUSTIC PULSE-ECHO WALL THICKNESS METHOD AND APPARATUS

Norman E. Flournoy, Houston, Tex., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 27, 1981, Ser. No. 286,921
Int. Cl.³ G01S *15/08*
U.S. Cl. 367—99 **6 Claims**



1. Acoustic pulse-echo wall thickness testing method, comprising the steps of

generating acoustic pulses in opposite directions simultaneously,

reflecting one of said pulses into a path normal to said wall,

reflecting the other of said pulses into a path oblique to said wall, and

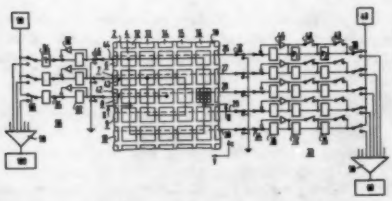
receiving returning pulses along both said paths to determine thickness and presence of an anomaly in said wall.

4,412,316

ULTRASONIC TRANSDUCER ARRANGEMENT

Heinrich Diepers, Höchstadt, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed May 20, 1981, Ser. No. 265,448
Claims priority, application Fed. Rep. of Germany, May 21, 1980, 3019409
Int. Cl.³ G01S *15/02, 7/54*
U.S. Cl. 367—105 **9 Claims**



1. An ultrasonic transducer array comprising:

a. a matrix of ultrasonic oscillators, each comprising a matrix of jointly controlled column-like transducer elements, the end faces of which are arranged in the plane of one of the flat sides of the matrix, the transducers of each oscillator connected to a common control electrode;

b. on one flat side of the matrix, a separate common control line for each row of ultrasonic oscillators; and

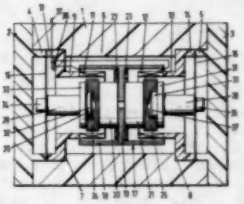
c. on the opposite flat side of the matrix, a separate common control line connected to electrodes of groups of ultrasonic oscillators arranged concentrically to each other.

4,412,317

TRANSDUCER FOR PICKING UP MECHANICAL VIBRATIONS, IN PARTICULAR SEISMIC WAVES, AND A SEISMIC MEASURING SYSTEM INCLUDING SUCH A TRANSDUCER

Ronald J. Asjes, Valkenswaard; Jacobus C. L. van Peppen, Delft, and Klaas B. Klaassen, 's-Gravenzande, all of Netherlands, assignors to De Regt Special Cable B.V., Capelle a/d Ijssel, Netherlands

Filed Dec. 19, 1980, Ser. No. 218,090
Claims priority, application Netherlands, Dec. 21, 1979, 7909287
Int. Cl.³ H04R *11/00*
U.S. Cl. 367—185 **27 Claims**



1. A transducer for picking up mechanical vibrations, in particular seismic waves, comprising:

a housing;

a magnet assembly having first and second magnets disposed in said housing for producing first and second permanent magnetic fields;

a coil system disposed in said housing including two separate coils respectively mounted in corresponding ones of said magnetic fields;

first means for supporting said magnet assembly and said coil system in said housing for relative movement;

said magnet assembly including second means defining a magnetic circuit path for electro-magnetically isolating said two separate coils from each other operative to provide a magnetic short-circuit path for dynamic magnetic fields produced by either one of said coils;

whereby, electromagnetic coupling exists only between respective ones of said two coils and the magnet assembly providing a coupling factor between said two coils substantially equal to zero.

4,412,318

DEVICE FOR DETECTING INTERBAND GAPS ON RECORD MEDIUM

Masao Goto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jan. 19, 1982, Ser. No. 340,538
Claims priority, application Japan, Jan. 23, 1981, 56-9370
Int. Cl.³ G11B *3/38, 17/06*
U.S. Cl. 369—41 **8 Claims**

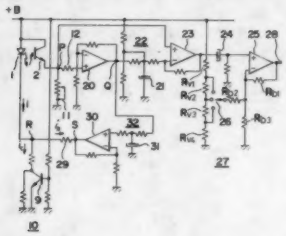
1. A device for detecting, on a record medium, positions of unrecorded interband regions disposed between bands of recorded information on said medium, in which differences in reflectivity of said regions and said bands are detected by emitting electromagnetic radiation to be incident on a recorded surface of said medium containing said bands and regions and detecting the level of the radiation reflected thereby, comprising

a radiation source for emitting a beam of said radiation to be incident upon said medium with a beam intensity that varies with a current furnished thereto;

detector means detecting the intensity of the beam reflected from said medium and providing an output level that varies with the intensity of the reflected beam;

interband region detecting circuit means having an input coupled to receive the output level of said detector means and providing an interband region detection signal in response to variations in said output level;

average level detecting means having an input coupled to said detector means and an output providing an average level signal in response to a time average of said output level; and



current control means having an input coupled to the output of said average level detecting means and an output coupled to said radiation source for controlling said current furnished to the same and thereby controlling the intensity of said radiation emitted thereby, such that the intensity of the reflected beam is automatically maintained within an operable range of said detector means and detecting circuit means notwithstanding variations from one record medium to another in the reflectivity thereof.

4,412,319

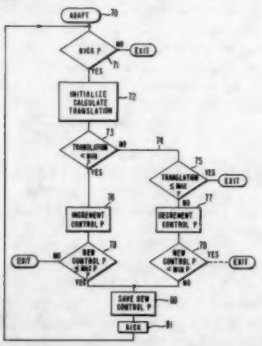
VIDEO DISC PLAYER WITH SELF CALIBRATING STYLUS TRANSLATOR

Bryon K. Taylor, Carmel, Ind., and George H. N. Riddle, Princeton, N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 86,246, Oct. 18, 1979, abandoned. This application Jul. 13, 1981, Ser. No. 283,051

Int. Cl.[3] **G11B** *7/00, 15/52;* **H04N** *5/76*

U.S. Cl. 369—43 **4 Claims**



1. In combination with a disc record player mechanism for recovering recorded information from disc records having information bearing tracks thereon, the recorded information including track identification signals, said player mechanism including circuitry responsive to user operated controls for generating player program commands, said player mechanism further including a track following signal pickup stylus cooperating with pickup circuitry for recovering the recorded signals, the signal pickup stylus being mounted to a first end of a stylus arm, the second end of which is supported by a compliant coupling in a carriage mechanism for translating the signal pickup stylus radially across the disc record, an adaptive stylus translating system for translating the stylus relative to said carriage mechanism comprising:

a transducer responsive to drive signals for selectively imparting stylus translation relative to said carriage mechanism and in a direction radially across said record;

a programmable pulse generator for generating incrementally variable drive signals in response to control signals for application to the transducer;

control circuitry responsive to said recovered track identification signals and to player program commands for generating and calibrating said control signals including;

(a) means for providing a nominal control signal for generating a drive signal to produce a prescribed transducer induced stylus translation;

(b) means responsive to recovered track identification signals for determining errors between the stylus translation induced by the transducer in response to said nominal control signal and said prescribed translation; and

means for adjusting the nominal control signal to reduce said errors thereby producing a corrected nominal control signal, said corrected nominal control signal inducing transducer produced stylus translations equal to the prescribed translation.

4,412,320

RELEASABLE COVER LOCKING DEVICE

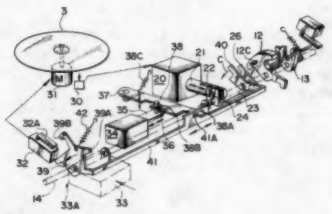
Akio Yamakawa, Atsugi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 26, 1981, Ser. No. 296,492

Claims priority, application Japan, Aug. 29, 1980, 55-122602[U]

Int. Cl.[3] **G11B** *1/00;* **E05B** *47/00;* **E05C** *3/06*

U.S. Cl. 369—79 **13 Claims**



8. A releasable cover locking device for a recording and/or reproducing apparatus of the type in which a record medium is adapted to be moved when power is supplied to said apparatus, said releasable cover locking device comprising:

support shaft means;

releasable locking means including first lever means rotatably mounted on said support shaft means, and biasing means for rotatably biasing said first lever means about said support shaft means to a locking position;

first release means for releasing said locking means when power is supplied to said apparatus and when the speed of movement of said record medium is less than a predetermined value, said first release means including release link means for biasing said first lever means about said support shaft means to an unlocked position against the biasing force of said biasing means, and actuating means for actuating said release link means to bias said first lever means about said support shaft means to said unlocked position when the speed of movement of said record medium is less than said predetermined value and when said power is

supplied to said apparatus, said release link means being rotatably mounted on said support shaft means and including a transmitting arm for biasing said first lever means about said support shaft means to said unlocked position, a driven arm and a connecting member for connecting said driven arm to said transmitting arm; and said actuating means including a reciprocable rod connected to said driven arm and plunger means for actuating said reciprocable rod when said power is supplied to said apparatus and when the speed of movement of said record medium is less than said predetermined value, wherein said transmitting arm biases said first lever means about said support shaft means to said unlocked position; and

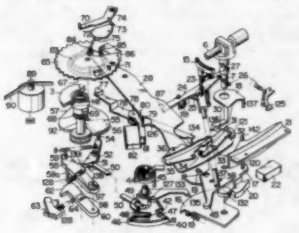
second release means for releasing said locking means when said power supplied to said apparatus is interrupted.

4,412,321

RECORD CHANGER

Shunji Tokumitsu, Machida; Hiroyuki Urushibata, Yokohama, and Masao Goto, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 18, 1981, Ser. No. 245,098
Claims priority, application Japan, Mar. 18, 1980, 55-34611
Int. Cl.³ G05B *19/28;* G11B *3/06*
U.S. Cl. 369—233 **7 Claims**



1. A record playing apparatus of the type including a center spindle on which records are adapted to be held and then dropped onto a turntable to be played, said record playing apparatus comprising:

arm means for reproducing signals recorded on a record situated on said turntable;

detecting means for detecting the position of said arm means;

common operating means for commonly controlling lead-in of said arm means from an inoperative position to an operative position and return of said arm means from an operative position to said inoperative position such that said lead-in of said arm means from said inoperative position to an operative position occurs only when said detecting means detects that said arm means is in said inoperative position; and

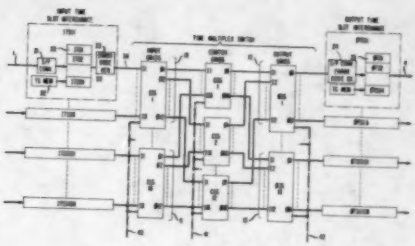
stopping means for controlling said common operating means to return said arm means from an operative position to said inoperative position when said detecting means detects that said arm means is in an operative position, said stopping means including three position plunger means which occupies a neutral position during return of said arm means from an operative position to said inoperative position, and record size selecting means associated with said three position plunger means for maintaining said arm means in said inoperative position after the latter is controlled by said stopping means to return thereto from an operative position so as to bring said record playing apparatus to a stop condition.

4,412,322

TIME DIVISION SWITCHING SYSTEM

Bruce E. Briley, Countryside, and John Montana, Wheaton, both of Ill., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sep. 25, 1980, Ser. No. 190,517
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—58 **24 Claims**



5. In a time division multiplex switching system comprising a switching network (FIGS. 1 to 3), at least part of which includes a space switching portion (TMS) for interconnecting input and output channels in which each channel is manifested by recurring periodic time slots each containing a prescribed number of information digits, a method of establishing connections through the network in which in response to a call a first path through the network is selected between an input channel and an output channel in accordance with a path hunt algorithm, said method being characterized by the steps of

transmitting one of the information digits of one of the time slots of the input channel to the output channel via the first path, and

reconfiguring the space portion of the network after the transmission of said one and each other information digit of said time slot such that each said digit is transmitted to the output channel via a different path of the space portion.

4,412,323

MULDEM WITH IMPROVED MONITORING AND CONTROL SYSTEM

Ned E. Abbott, McKinney, Tex.; Hampapur R. Keshavan, Huntington Beach, Calif., and Robert J. McGuire, Richardson, Tex., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Jun. 3, 1980, Ser. No. 155,988
Int. Cl.³ H04J *3/14*
U.S. Cl. 370—16 **12 Claims**

1. A multiplexer comprising in combination:

a plurality of parallel data input groups;

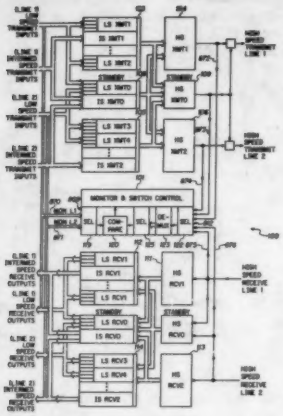
normally on-line transmission means multiplexing said data input groups for serial transmission of high speed data;

standby data protective switching means providing an alternate data path around said transmission means; and

monitor means testing data paths through said multiplexer for detection of malfunctions in said multiplexer and automatically switching a defective normally on-line data path to standby through said alternate data path,

said monitor means including lockout selection means for manually selecting a data path through said multiplexer which is not to be switched to standby, and means for automatically checking the selection accomplished by the

lockout means prior to switching any data path to standby, so as to prevent the selected path from switching



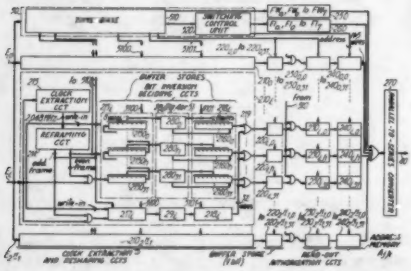
to standby, while permitting automatic protective switching or other data paths.

4,412,324

BIT-BY-BIT TIME-DIVISION SWITCHING NETWORK

Albert Glowinsky, Clamart, and Pierre M. Lucas, Issy-Les-Moulineaux, both of France, assignors to Etat Francais, Issy-Les Moulineaux, France

Filed May 18, 1981, Ser. No. 264,813
Claims priority, application France, May 23, 1980, 80 11549
Int. Cl.³ H04J *6/00*; H04Q *11/04*
U.S. Cl. 370—58 **8 Claims**



1. A time-division digital switching network for switching a plurality of incoming and outgoing isochronous digital data channels transmitting data words consisting of a given even or odd number of bits and having rates which are different but sub-multiples of a given low rate, said switching network comprising:

means for phasing said incoming digital channels;

means connected to said phasing means for adding the bits of each data word of each phased incoming channel into a sum to produce an additional bit having first and second binary states when said sum is respectively no greater and greater than half of the given bit number;

first means controlled by said adding means for selectively inverting and not inverting the bits of said data word of said phased incoming channel in response to the state of said additional bit;

means controlled by said adding means for deriving inversion indicating words, each indicating whether the bit states of each incoming channel word have or have not been inverted;

means for storing the bits having the same rank in said phase incoming channel data words;

means for detecting stored same rank bits having a predetermined binary state;

means for storing address words of said outgoing digital channels to be switched to said incoming digital channels;

means controlled by said predetermined binary state bit detecting means for reading stored outgoing channel address words corresponding to switched incoming channels with bits having said predetermined binary state and the same rank;

means for multiplexing the read outgoing channel address words and said bit inversion indicating words into an address word multiplex digital highway at high rate;

means connected to said multiplex digital highway for detecting said address words of each outgoing digital channel;

means controlled by said address word detecting means for supplying a bit having said first and second binary states to said rank of a data word of said outgoing digital channel in response to said address word of said outgoing digital channel being detected and not detected, respectively;

means connected to said intermediate digital highway for detecting said inversion indicating words for said incoming digital channel words corresponding to each outgoing digital channel to restore said additional bits; and

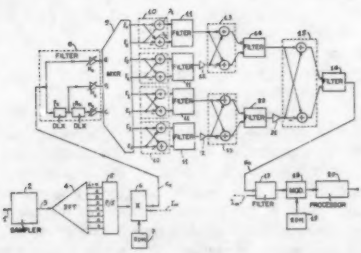
second switching means controlled by said inversion indicating word detecting means for transmitting uninverted and inverted replicas of the bits of each data word transmitted from said supplying means to said outgoing digital channel in response to the binary state of said additional bit corresponding to said data word.

4,412,325

EQUIPMENT FOR SINGLE BAND MULTIPLEXING THROUGH DIGITAL PROCESSING

Francesco Molo, Milan, Italy, assignor to Telettra- Telefonia Elettronica e Radio S.p.A., Milan, Italy

Filed Jul. 13, 1981, Ser. No. 282,644
Int. Cl.³ H04J *4/00*
U.S. Cl. 370—70 **6 Claims**



1. A single sideband system for multiplexing and demultiplexing a given number of baseband signals equal to a power of two, said system having a multiplexing section comprising:

sampling means for sampling the incoming baseband signals at a predetermined sampling frequency to transform the baseband signals into complex sample signals of sample digital form having real and imaginary parts and a frequency spectrum which is symmetrically arranged around zero frequency;

process means for performing a Discrete Fourier Transform on said complex sample signals in groups and in a substantially identical manner for each group to be frequency multiplexed;

wherein each group of signals contains a number of signals equal to a total number of signals to be frequency multiplexed divided by a power of two, there being at least a first and a second of said groups of said signals;

a multiplier for multiplying said complex sample signals by complex numbers to frequency modulate the complex sample signals;

at least first and second synchronously operating demultiplexers for demultiplexing the real and imaginary parts, respectively, of the frequency modulated signals from said multiplier;

first and second substantially identical filter and modulator circuits, each having one output and a number of inputs equal to the number of said groups of said complex signals, each circuit receiving the real and imaginary parts, respectively from said demultiplexer of the demultiplexed signals of respective signal groups in a serial manner and cyclically in time, the filter portions of said circuit comprising a set of individual filters with a passband equal to the frequency which characterizes each baseband signal, said individual filter being cascade-connected to supply one filtering function with a passband symmetrically arranged around the zero frquency and around frequencies which are integral multiples of the predetermined sampling frequency, and wherein said circuits each include individual modulators for frequency shifting the frequency spectra of signals passing through said circuit by a power of two of a basic frequency which is equal to the predetermined sampling frequency multiplied by the number of signals contained in each groups of signals, said individual filters and modulators being connected in a tree-like structure, wherein the output signals of one-half of the individual filters is summed with the output signal of an identical filter from the other half of the individual filters after the output signals from said other half of said filters is passed through one of said individual modulators; and

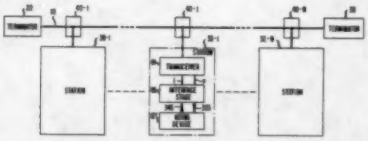
modulator means for frequency translating the output signal from one output of said filter and modulator circuits by one quarter of the predetermined sampling frequency to provide a sampled multiplexed signal in the form of complex output signal samples having real portions which represent single sideband frequency multiplexing of the system input baseband signals.

4,412,326

COLLISION AVOIDING SYSTEM, APPARATUS AND PROTOCOL FOR A MULTIPLE ACCESS DIGITAL COMMUNICATIONS SYSTEM INCLUDING VARIABLE LENGTH PACKETS

John O. Limb, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Oct. 23, 1981, Ser. No. 314,489
Int. Cl.³ H04J *6/00*
U.S. Cl. 370—85 **21 Claims**



1. A method for controlling digital signals in a communications system, said system including a communications path, a plurality of stations, at least two of said stations being coupled to said path, said method including the steps of writing signals on said path and reading signals from said path and characterized in that said method further comprises the steps of :

responsive to signals read from said path, avoiding a collision on said communications path, said collision avoiding step including

detecting that a first packet, which is received at a first station on said path, has been transmitted from a second station on said path, and

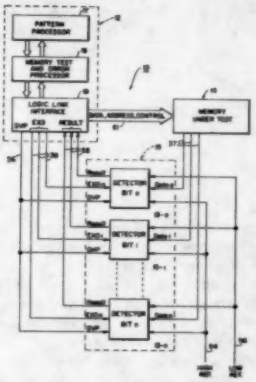
introducing a first predetermined time delay before said first station is permitted to transmit a second packet, said predetermined time delay being related to the electrical distance between said first and said second stations.

4,412,327

TEST CIRCUIT FOR CHECKING MEMORY OUTPUT STATE CONTINUOUSLY DURING TIME WINDOW

William B. Fox, Columbus, and Harry L. Maddox, Reynoldsburg, both of Ohio, assignors to Western Electric Company, Inc., New York, N.Y.

Filed Feb. 25, 1981, Ser. No. 237,836
Int. Cl.³ G01R *31/28*
U.S. Cl. 371—21 **21 Claims**



1. A test circuit for continuously sensing for the presence of valid "one" and "zero" data bit signals read out of a memory when under test throughout an established time window test period, said circuit comprising:

first means, conditionally responsive to a data bit signal, a first time window-controlling signal, and selectively to a second expected reference data bit signal and the complement thereof, when applied thereto, for comparing the logic state of each data bit signal when received from the output of a memory under test relative both to selective predetermined high and low reference voltage limits, when applied to said first means, and to a selected one of the second signal and its complement, when also applied to said first means, with the selected one of the latter two signals, during each time window test period, being predetermined to have the logic state expected of a data bit signal to be compared, and said first means, when made conditionally responsive, producing a high voltage output whenever the state of an applied data bit signal continuously remains valid throughout said time window, and for producing a low voltage output whenever such a data bit signal is sensed at any time to be invalid during a given time window, and

second means, responsive to a high voltage output from said first means, and an applied first signal, for producing a "pass" output signal that corresponds in logic state to that of a continuously valid data bit signal when applied to both said first and second means during each time window, with said second means, in response to a low voltage output from said first means, and an applied first signal, producing a "fail" output signal that corresponds in logic state to that of an invalid data bit signal, even if the latter

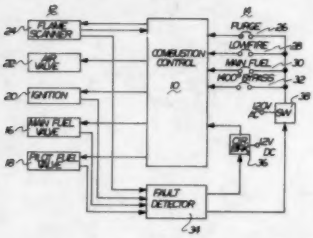
is only momentarily invalid, when applied to both said first and second means during any given time window, said "pass" and "fail" signals remaining for interrogation after the termination of said time window, and a change of any low voltage output from said first means to a high voltage output, until at least the termination of each data bit signal as applied to both said first and second means.

4,412,328

ELECTROMECHANICAL DEVICE DRIVE CIRCUIT FAULT DETECTION APPARATUS

John L. Homa, Lyndhurst, Ohio, assignor to The North American Manufacturing Company, Cleveland, Ohio

Filed Feb. 4, 1981, Ser. No. 231,498
Int. Cl.³ G06F *11/00*
U.S. Cl. 371—25 **13 Claims**



1. Apparatus for verifying the proper operation of a drive circuit which controls the application of power to an electromechanical device comprising:

means for applying a control signal to said drive circuit to cause said drive circuit to apply power to said electromechanical device for an interval of time too brief to cause actuation of said device;

said drive circuit including a controlled switching element connected in series with said electromechanical device across a power source and means for controlling the conductance state of said controlled switching element; and

means for sensing the power applied across said device to verify that power has been properly applied thereto by said drive circuit in response to said control signal;

said apparatus being adapted for use with a drive circuit wherein said means for controlling the conductance state of said controlled switching element includes means for rendering said element conductive in response to said control signal, said element remaining conductive thereafter until the level of current passing through it drops below a limit, said apparatus further comprising reset means for causing said current to drop below said limit in order to reset said conductive element after said controlled switching element has been properly rendered conductive in response to said control signal.

4,412,329

PARITY BIT LOCK-ON METHOD AND APPARATUS

John M. Yarborough, Jr., Palo Alto, Calif., assignor to SRI International, Menlo Park, Calif.

Filed Oct. 15, 1981, Ser. No. 311,782
Int. Cl.³ H04L *7/02*
U.S. Cl. 371—47 **10 Claims**

1. Parity bit lock-on apparatus for use in locking onto parity bits included in a serial bit stream of equal length words each of which words includes a plurality of data bits and a parity bit, said apparatus comprising,

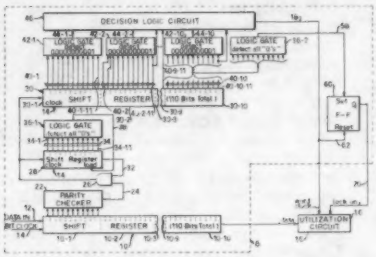
a data shift register having a serial input into which the serial bit stream is shifted and including a plurality of word length sections,

means for parity checking the word length group of bits contained in the first section of the data shift register every bit interval of the bit stream shifted into the register,

a first parity bit shift register having a serial input and a serial output, and having a length of one word,

a second parity bit shift register having a serial input, parallel outputs and having a length equal to that of the data shift register,

means under control of the serial output of said first parity bit register for shifting the output from said parity check-



ing means into the serial inputs of said first and second parity bit shift registers when the serial output from said first parity bit shift register is a 1-bit and for shifting a 0-bit into the first and second parity bit shift registers when the serial output from the first parity bit shift register is a 0-bit, and

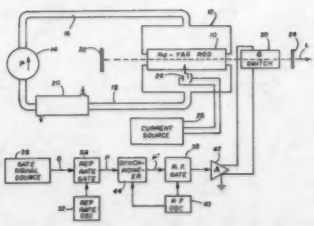
means responsive to parallel outputs from said second parity bit register for generating word clock pulses in synchronization with parity bits of words shifted into the final stage of said data shift register.

4,412,330

Q-SWITCHED LASER WITH STABLE OUTPUT AND METHOD OF MAKING THE SAME

Michael S. Mauck, and William S. Neeland, both of Portland, Oreg., assignors to Electro Scientific Industries, Inc., Portland, Oreg.

Filed Apr. 16, 1981, Ser. No. 254,895
Int. Cl.³ H01S *3/13*
U.S. Cl. 372—29 **12 Claims**



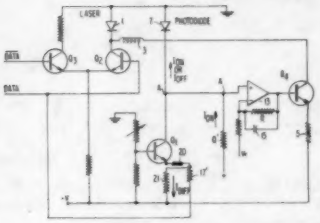
1. In a Q-switched laser having an acousto-optic Q-switch driven intermittently by RF signals having a repetitive wave and interrupted periodically by laser gating pulses having leading and trailing edges, the method of stabilizing the output laser pulses comprising synchronizing the laser gating pulses and the phase of the RF signals with each other.

4,412,331

FEEDBACK CIRCUIT FOR CONTROLLING THE PEAK OPTICAL OUTPUT POWER OF AN INJECTION LASER

Lynn C. Chapman, Gaithersburg, Md., assignor to M/A-COM DCC, Inc., Germantown, Md.

Filed Apr. 22, 1981, Ser. No. 256,466
Int. Cl.³ H01S 3/00
U.S. Cl. 372—29 4 Claims



1. Apparatus for controlling a bias current of a laser at an appropriate operating point, comprising:

means for operating a laser either in an ON state or an OFF state in response to corresponding data signals,

photodiode means for receiving at least a portion of radiation emitted by a laser to be so controlled and for passing a photodiode current corresponding to incident radiation,

a current node coupled to said photodiode means,

a fixed source of current of magnitude I_{ON}, said magnitude I_{ON} corresponding to a photodiode current produced by a laser in said ON state and biased at an appropriate operating point, said fixed source of current also coupled to said node,

current source means for generating a current of magnitude of zero or I_{DIFF}, where I_{DIFF} is a difference between I_{ON} and I_{OFF}, where I_{OFF} is a photodiode current produced by a laser to be so controlled in an OFF state operating at an appropriate bias point, said current source means also connected to said node, and

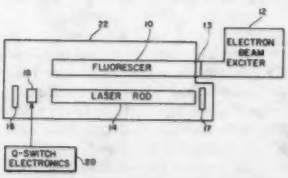
processing means responsive to a net current coupled to said node for deriving said bias current for said laser to be so controlled, wherein said processing means includes an integrator for integrating said net current and producing a signal corresponding to said net integrated current, and means responsive to said net integrated current for producing a bias current inversely proportional thereto.

4,412,332

HIGH EFFICIENCY STORAGE LASER

Mark G. Knights, Brookline, and Evan P. Chicklis, Nashua, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Mar. 16, 1981, Ser. No. 244,375
Int. Cl.³ H01S 3/091
U.S. Cl. 372—70 2 Claims



1. A high efficiency storage laser, comprising:

a resonant cavity;

means for extracting energy from said cavity;

a solid state Tm:LiYF$_4$ crystal disposed in said cavity; and

pump means including an XeBr* mixture and an electron beam exciter for supplying energy to the XeBr* mixture to cause the XeBr* mixture to spontaneously emit sufficient radiation within the absorption band of the Tm:LiYF$_4$ crystal to cause lasing; and

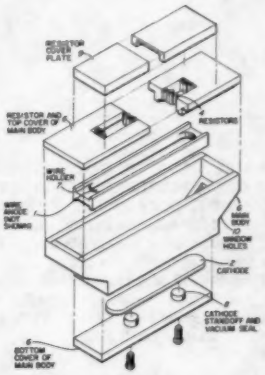
means for supplying the radiation from the spontaneously emitting fluorescer to said crystal.

4,412,333

THREE-ELECTRODE LOW PRESSURE DISCHARGE APPARATUS AND METHOD FOR UNIFORM IONIZATION OF GASEOUS MEDIA

Edward J. McLellan, 422 Connie Ave., Los Alamos, N. Mex. 87544

Filed Oct. 17, 1980, Ser. No. 198,028
Int. Cl.³ H01S 3/097
U.S. Cl. 372—87 10 Claims



1. An apparatus for uniformly ionizing a gaseous medium and substantially uniformly depositing substantial energy therein which comprises in combination:

(a) a pair of rectangular electrodes including a metal cathode and a wire screen anode, said anode being spaced apart from, approximately coextensive with, and disposed in a substantially parallel manner to said cathode and forming a first volume therebetween enclosed on two sides by said pair of rectangular electrodes into which the gaseous medium can freely travel;

(b) a close-packed array of high voltage impedance elements disposed in a planar configuration, said array being spaced apart from, approximately coextensive with, and located in a substantially parallel manner to said anode on the opposite side thereof from said cathode and with said anode forming a second volume therebetween into which the gaseous medium can freely travel, said second volume being enclosed on two sides by said anode and said array, each of said impedance elements in said array thereof including a first electrical lead and a second electrical lead, all of said first electrical leads being unconnected, approximately of equal length and disposed in a manner substantially perpendicular to said planar configuration and pointing toward and spaced apart from said anode, and all of said second leads being brought into electrical contact forming an electrical bus thereby said bus being disposed on said array in a direction away from said anode;

(c) means for producing a low energy, high voltage pulse between said bus and said anode thereby forming a first electric discharge in the gaseous medium present in said second volume, said first electric discharge producing a uniform ionization of the gaseous medium in said second

volume which extends into said first volume through said anode in a manner sufficient to produce substantial uniform ionization of the gaseous medium therein;

(d) means for producing a high dc potential difference between said pair of electrodes said potential difference being below the breakdown limit of the gaseous medium in said first volume, said potential difference producing means being capable of delivering substantial energy to a second electric discharge occurring between said pair of electrodes said second electric discharge being initiated and controlled solely by said substantial uniform ionization of the gaseous medium in said first volume, said second electric discharge depositing substantial energy in the gaseous medium; and

(e) a gas impermeable enclosure for containing and supporting said pair of electrodes and said array of impedance elements, and containing the gaseous medium.

4,412,334

METHOD OF MELTING VITREOUS MATERIALS AND USE OF THE SUITABLE DEVICE FOR THE ACCOMPLISHMENT OF THE METHOD

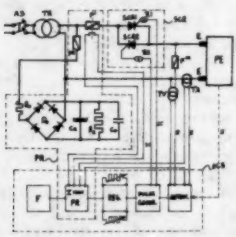
Maurizio G. Tironi, Modena; Mario Barbini, and Giannetto Del Sere, both of Florence, all of Italy, assignors to Elettromeccanica Tironi S.r.l., Italy

Continuation of Ser. No. 117,853, Jan. 31, 1980. This application Apr. 6, 1982, Ser. No. 365,984

Claims priority, application Italy, Feb. 19, 1979, 40024 A/79

Int. Cl.³ C03B *5/027*

U.S. Cl. 373—40 **4 Claims**



1. A method of melting vitreous materials in electric melting plants by controlling the thermal energy supplied electrically to the vitreous mass during the process of melting and/or refining and/or homogenization, comprising the steps of supplying energy to the plant according to supply cycles each having a time interval P, making up each supply cycle P of a time period t_c when power is supplied to said vitreous mass and a time period t_{nc} when no power is supplied, selecting the lengths of said intervals of time t_c and t_{nc} to be each equivalent to an integral number of cycles of the alternating voltage acting on the electrodes, sensing the values of selected operating parameters of said plant, including current, power and/or temperature providing means to control the ratio of t_c to P, feeding signals proportional to said sensed values of said ratio control means, and using said feed back signals to adjust the ratio of t_c to P in each time interval P in response to variations of the values of said selected parameters.

4,412,335

DIGITAL SIGNAL DISTRIBUTION SYSTEM

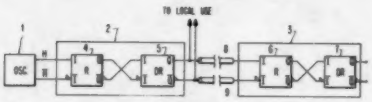
Jean-Claude Froment, Villeneuve-Loubet; Jean-Louis Marijon, Gradignan; Gerard Orengo, Antibes, and Michel Verhaeghe, Le Suve, all of France, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 25, 1981, Ser. No. 305,564

Claims priority, application European Pat. Off., Nov. 28, 1980, 80430027.5

Int. Cl.³ H03K *6/02*

U.S. Cl. 375—3 **4 Claims**



1. A digital signal distribution system for distributing digital signals to points of a signal transmission chain, characterized in that it includes, at each of said points:

a distribution device being comprised of a receiver and at least one driver, said receiver and driver which are matched and have a true input and a complementary input respectively in phase with a true output and a complementary output, are connected such that the true output of the receiver is connected to the complementary input of the driver and the complementary output of the receiver is connected to the true input of the driver.

4,412,336

STORAGE COMPARATOR, FOR REGENERATING DIGITAL ELECTRIC SIGNALS AND DIGITAL TRANSMISSION SYSTEM USING SUCH A COMPARATOR

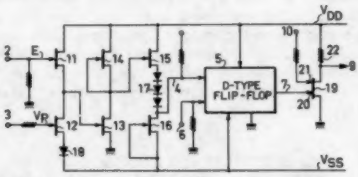
Michel Peltier; Maurice Gloanec; Gerard Nuzillat; Vincent Maurel, and Michel Charrier, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Nov. 3, 1980, Ser. No. 203,380

Claims priority, application France, Nov. 5, 1979, 79 27217

Int. Cl.³ H03K *5/153*

U.S. Cl. 375—4 **5 Claims**



1. A storage comparator, providing regeneration of digital electric signals transmitted over coaxial lines, comprising: a D-type field effect transistor flip-flop triggered on leading edges, said comparator further comprising:

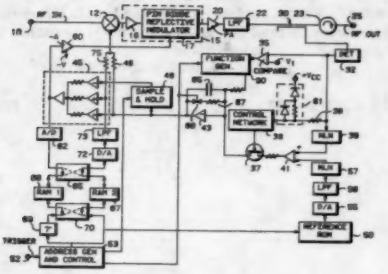
an input stage having a FET adjustable threshold voltage comparator, which receives a signal on a first input terminal and a polarization signal on a second input terminal, said polarization signal allowing a choice of the threshold for the signal at the input of the D-type flip-flop, and at least one diode locating said threshold near the FET's threshold, in said input stage; and

an output stage, formed by a double-gate FET, which receives at a first gate thereof the signals from the output terminal of the flip-flop, and at a second gate thereof a control voltage for the impedance adjustment of the output signal.

4,412,337
POWER AMPLIFIER AND ENVELOPE CORRECTION CIRCUITRY

Robert H. Bickley, Scottsdale; Christopher D. Broughton, and Thad J. Genrich, both of Mesa, all of Ariz., assignors to Motorola Inc., Schaumburg, Ill.

Filed Nov. 4, 1981, Ser. No. 318,281
Int. Cl.³ H04B 1/03
U.S. Cl. 375—60 16 Claims



1. A power amplifier and envelope correction circuitry comprising:

(a) a power amplifier having an output and an input;

(b) envelope generating means for generating a preferred envelope;

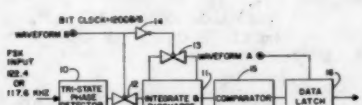
(c) error determining means, coupled to the output of said amplifier and to said envelope generating means, including a comparison circuit for comparing envelopes at the outputs thereof to determine errors therebetween and provide error signals representative of the difference between the compared envelopes and further including storage means for storing a previous predistorted envelope and combining circuitry for combining the error signals with the stored envelope to produce a corrected predistorted envelope; and

(d) modulating means coupled to the input of said amplifier and to receive the corrected predistorted envelope from said error determining means for modulating input signals applied to the input of said amplifier so that output signals at the output of said amplifier have an envelope substantially similar to the generated preferred envelope.

4,412,338
FREQUENCY SHIFT KEYED DETECTOR SYSTEM

Max S. Hendrickson, Forest Lake, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 28, 1981, Ser. No. 306,273
Int. Cl.³ H03D 3/18
U.S. Cl. 375—82 5 Claims



1. A method of discriminating FSK transmitted signals comprising the steps of:

combining a reference input signal of known frequency with an FSK data input signal of unknown frequency but known bit time in a tri-state phase detector;

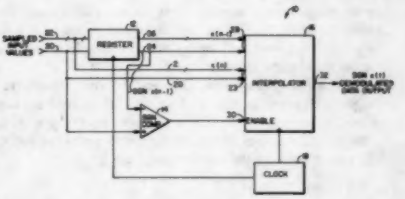
causing a portion of the output of said tri-state phase detector to be integrated in an integrating circuit means and discharged to a means for determining the binary equivalent thereof once each bit time; and

controlling the integration and discharge function of said integrater circuit means such that the integration function remains disabled for a time at least equal to the minimum clearing time of the tri-state detector before integration is begun during each bit time.

4,412,339
ZERO-CROSSING INTERPOLATOR TO REDUCE ISOCHRONOUS DISTORTION IN A DIGITAL FSK MODEM

Peter H. Alfke, Los Altos Hills, and Michael K. Stauffer, Redwood City, both of Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 24, 1981, Ser. No. 305,015
Int. Cl.³ H03D 3/18
U.S. Cl. 375—95 8 Claims



1. An apparatus for processing a plurality of digital values in a sequence of discrete samples of a continuous signal in a digital data communication receiver, each of said discrete samples being separated by a sampling interval, said apparatus comprising:

means for comparing a first discrete sample of said sequence with a second subsequent discrete sample of said sequence to sense for a change in sign between said first and second samples;

means responsive to a change in sign between said first and second samples for interpolating between values of said first sample and said second sample, which means for interpolating generates a timing signal for estimating the time of occurrence of a zero-crossing of said continuous signal prior to said second sample;

clock means for establishing a plurality of subintervals, each of which is a fraction of said sampling interval;

the means for comparing including means for subtracting the value of said first sample from the value of said second sample to produce an interval difference value;

means coupled to said subtracting means for dividing said interval difference value into a number of subinterval difference values each of which is representative of the fractional change of said interval difference value during each said subinterval;

means responsive to said clock means for repeatedly summing the value of a subinterval difference value and the sum of said first sample and previously summed subinterval difference values in order to generate interpolated values; and

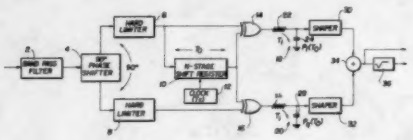
means responsive to said summing means for indicating a zero-crossing of said continuous signal upon occurrence of a change in sign between two successive interpolated values.

4,412,340

ONE-BIT AUTOCORRELATION ENVELOPE DETECTOR

Marion C. Bartlett, and Raymond C. Johnson, both of Gainesville, Fla., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 28, 1981, Ser. No. 334,626
Int. Cl.³ H03D 3/02
U.S. Cl. 375—96 7 Claims



1. Correlation apparatus for detecting an unknown, narrowband signal in the presence of wide-band noise-like interference, comprising,

bandpass filter means for accepting said signal and noise and providing a frequency limited output signal,

means for receiving said output signal and for providing therefrom first and second outputs which are phase-shifted 90° for each other,

means for hard-limiting said first and second outputs to provide first and second hard limited digital signals,

means for autocorrelating said first and second hard-limited signals at a selected delay to provide first and second autocorrelation signals,

means for integrating said first and second autocorrelation signals to provide first and second integrated signals, and

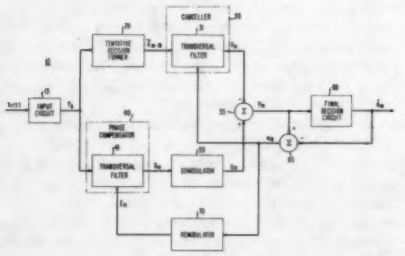
means for processing said first and second integrated signals for providing an estimate of the envelope of the autocorrelation of said frequency limited signal.

4,412,341

INTERFERENCE CANCELLATION METHOD AND APPARATUS

Allen Gersho, Goleta, Calif.; Edmond Y. Ho, Colts Neck Township, Monmouth County, N.J.; Richard D. Gitlin, Monmouth Beach, N.J.; Victor B. Lawrence, Holmdel, N.J., and Tong L. Lim, Middletown, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Nov. 18, 1981, Ser. No. 322,517
Int. Cl.³ H04B 3/14
U.S. Cl. 375—102 47 Claims



1. Apparatus for processing an interference-corrupted signal representing a plurality of data signal values, said interference-corrupted signal having a frequency spectrum said apparatus comprising

$$Y(\omega)=|Y(\omega)|e^{j\theta_Y(\omega)}$$

means for generating in response to said interference-corrupted signal a phase-compensated signal whose frequency spectrum is a function of $|Y(\omega)|$ and is substantially independent of $\theta_Y(\omega)$,

canceller means for forming in response to a stream of tentative decisions as to said signal values a cancellation signal representing the interference in said phase-compensated signal, said tentative decisions having been formed in response to said interference-corrupted signal, and

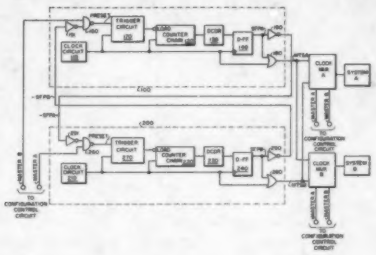
means for forming a stream of final decisions as to said signal values in response to said phase-compensated and cancellation signals.

4,412,342

CLOCK SYNCHRONIZATION SYSTEM

Ashfaq R. Khan, Glendale Heights, and Ivan L. Edwards, Downers Grove, both of Ill., assignors to GTE Automatic Electric Labs Inc., Northlake, Ill.

Filed Dec. 18, 1981, Ser. No. 332,137
Int. Cl.³ H03K 1/17
U.S. Cl. 375—107 12 Claims



1. A clock synchronization system for use in a switching system including a plurality of clock circuits, each operated to provide periodic clock pulses, and a control circuit operated to exclusively provide a master clock signal for each clock circuit, said clock synchronization system comprising:

a plurality of clock synchronization circuits each connected to an associated one of said clock circuits, to said control circuit, and to each other clock synchronization circuit, and each operated in response to a predetermined number of said clock pulses from said associated clock circuit and an absence of said master clock signal for each other clock circuit, to provide a timing pulse;

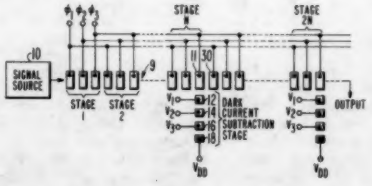
each clock synchronization circuit further operated in response to said master clock signal for each other clock circuit, said timing pulse from each other clock synchronization circuit and a predetermined number of said clock pulses from said associated clock circuit to provide said timing pulse.

4,412,343

CHARGE TRANSFER CIRCUITS WITH DARK CURRENT COMPENSATION

Walter F. Kosonocky, Skillman, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 28, 1979, Ser. No. 15,772
Int. Cl.³ G11C 19/28; H01L 29/78
U.S. Cl. 377—58 7 Claims



1. In a charge coupled device (CCD) delay line which in-

cludes a semiconductor substrate, electrodes insulated from the substrate to which multiple phase voltages are applied for creating potential wells in the substrate for the storage and propagation of signal charge packets along the length of the delay line, and in which dark current charges are produced which add to the charge packets as they are being propagated along the delay line, a system for reducing the effect of the dark current charge comprising:

means coupled to said CCD delay line for subtracting from each signal charge packet, after it has accumulated a fixed amount of dark current charge, not greater than a relatively small fraction of the capacity of one of said potential wells, said fixed amount of charge and for disposing of the subtracted charge, said means comprising:

M second CCD's coupled to said delay line, where M is an integer equal to at least 1, each such second CCD being located at a point along said CCD delay line at which a charge packet arrives after it has accumulated said fixed amount of dark current charge, each such second CCD comprising:

means including two electrodes coupled to a common voltage source and with a fixed offset voltage between them for creating a potential well in said substrate;

means for propagating each charge packet reaching said second CCD to said potential well;

means for returning all except said fixed amount of said charge in said well to said CCD delay line;

a drain; and

means for shifting said fixed amount of charge to said drain.

4,412,344
INTEGRATED RECTIFIER CIRCUIT

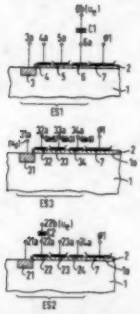
Manfred Mauthe, Munich, and Hans-Jörg Pfleiderer, Zorneding, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 19, 1980, Ser. No. 161,134

Claims priority, application Fed. Rep. of Germany, Aug. 31, 1979, 2935292

Int. Cl.³ G11C *19/28*; H01L *29/78*

U.S. Cl. 377—60 **5 Claims**



1. An integrated rectifier circuit comprising:

a doped semiconductor substrate having a boundary surface;

an insulating layer covering said boundary surface;

a plurality of transfer electrodes on said insulating layer respectively charged with successive clock pulses forming a charge transfer device transfer channel in a region of said substrate beneath said transfer electrodes;

a first input stage for said charge transfer device transfer channel consisting of

a first region disposed in said substrate at said boundary layer and doped oppositely thereto,

a first pair of input gate electrodes disposed on said insulating layer between said first region and said transfer channel;

a second input stage for said charge transfer device transfer channel consisting of

a second region disposed in said substrate at said boundary layer and doped opposite thereto,

a second pair of input gate electrodes disposed on said insulating layer between said second region and said transfer channel;

said first and second regions being connected to a common clock pulse voltage;

each of said input gate electrodes being connected to respective constant voltage sources having a magnitude such that a uniform surface potential is generated in the substrate regions covered by the input gate electrodes;

one of said input gate electrodes in said first pair which is disposed at a greater distance from said first region being charged with an alternating voltage component of an input signal;

one of said input gate electrodes in said second pair disposed closer to said second region being charged with said alternating voltage component of said input signal;

a third input stage for said charge transfer device consisting of

a third region disposed in said substrate having a conductivity type opposite to that of said substrate,

a third pair of input gate electrodes disposed on said insulating layer between said third region and said transfer channel,

said input gate electrodes in said third pair being respectively connected to constant voltage sources of differing magnitudes with an input gate electrode of said third pair which is disclosed closer to said third region being charged with a smaller of the constant voltages; and

an output stage for said charge transfer device at which an output signal is generated,

whereby said alternating voltage component in said output signal is rectified.

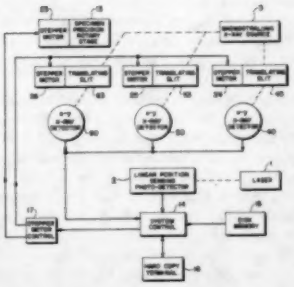
4,412,345
APPARATUS AND METHOD FOR PRECISE DETERMINATIONS OF CRYSTALLOGRAPHIC ORIENTATION IN CRYSTALLINE SUBSTANCES

S. Thomas Workman, Saratoga; John L. Chambers, Sunnyvale; Myron A. Pugh, San Jose, all of Calif., and Roger W. Ward, Loveland, Colo., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 3, 1981, Ser. No. 289,353

Int. Cl.³ G01N *23/20*

U.S. Cl. 378—078 **5 Claims**



3. A method of measuring the crystallographic orientation of single crystal plates of singly and doubly rotated cuts comprising the steps of;

affixing a major surface of a crystal to be measured to a rotatable table;

reflecting the output of a collimated light source from a small portion of a major surface of said crystal,

measuring the degree of precession of said reflected light beam;

reflecting from said small portion of said crystal the output of another source of collimated electromagnetic radiation capable of producing at least two diffracted reflections;

measuring the angle of each of the diffracted reflections generated from said other source; and

computing the angle of cut from the measured angles.

4,412,346

X-RAY PHOTOGRAPHY APPARATUS

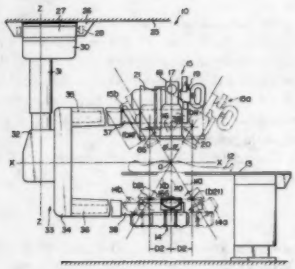
Eisuke Takenouti, Yamato, and Sigeru Urata, Tochigi, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Jul. 19, 1982, Ser. No. 399,868

Claims priority, application Japan, Jul. 21, 1981, 56-114982

Int. Cl.³ G01N *21/26*; G01J *3/34*; G03B *41/16*

U.S. Cl. 378—181 **7 Claims**



1. An X-ray photography apparatus comprising:

a rotating body rotatable about a substantially horizontal main axis;

an X-ray tube for radiating an X-ray beam along a main plane containing said main axis;

an image receiving device for photographing an X-ray image formed after the X-ray beam is transmitted through a subject lying in the path of the X-ray beam;

first transfer means capable of supporting said image receiving device in a position off said main axis and moving said image receiving device substantially parallel to said main axis over a range exceeding the half length of the stature of the subject;

second transfer means capable of supporting said X-ray tube substantially on the opposite side of said main axis to said image receiving device and moving said X-ray tube substantially parallel to said main axis over a range exceeding the half length of the stature of the subject;

first tilting means attached to said first transfer means to change the direction of said image receiving device within said main plane;

second tilting means attached to said second transfer means to change the direction of said X-ray tube within said main plane; and

means capable of driving said first and second transfer means and said first and second tilting means to set independently the position and direction of said X-ray tube within said main plane and the position and direction of said image receiving device within said main plane.

4,412,347

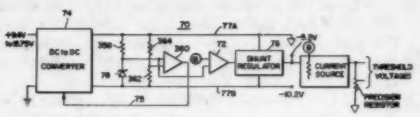
PRECISION SETTING OF CURRENTS AND REFERENCE VOLTAGES

Jesse B. Lipcon, Harvard, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Continuation-in-part of Ser. No. 267,394, May 26, 1981, Pat. No. 4,384,363. This application Aug. 11, 1981, Ser. No. 292,006

Int. Cl.³ H04B *1/00, 1/40*

U.S. Cl. 455—58 **4 Claims**



1. A precision combination voltage and current source comprising:

means for providing a first d.c. power supply voltage;

regulator means for providing a second d.c. power supply voltage derived from said first voltage, the amplitude of the second voltage being variable responsive to a control signal;

a current source energized by and having an output that varies with the second voltage;

a means within the current source for developing a voltage across a resistor proportional to the output of the current source;

means for providing a precision reference voltage equal to the desired voltage across said resistor; and

means for comparing the voltage across the resistor with the precision reference voltage, and for generating the regulator control signal in response to the comparison,

whereby the second d.c. power supply voltage is driven by the control signal to a value which causes the voltage across the resistor to tend to equal the reference voltage, thereby simultaneously providing the voltage needed to establish the output of the current source at the desired level and also providing the desired second power supply voltage.

4,412,348

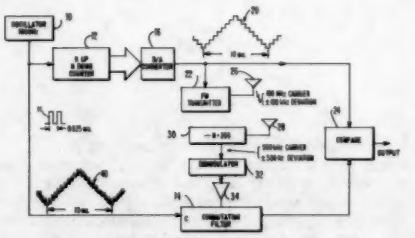
APPARATUS FOR TESTING LINEARITY OF AN FM TRANSMITTER

Eldon M. Sutphin, Jr., Merrimack, N.H., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 16, 1982, Ser. No. 369,009

Int. Cl.³ H04B *17/00*

U.S. Cl. 455—67 **4 Claims**



1. Apparatus for testing the amplitude vs. frequency linearity of an FM transmitter receptive of varying amplitudes at an input for producing corresponding various modulation frequencies at an output comprising, in combination:

means for producing an analog signal which varies in amplitude in a known manner at a known rate and including means for producing a signal indicative of said rate;

means for applying the analog signal to said transmitter to be tested for causing said transmitter to produce a radio frequency FM signal modulated in accordance with the analog signal provided thereto;

means to demodulate the said radio frequency FM signal from said transmitter to produce an analog signal corresponding to the modulation frequency of said transmitter;

a commutating filter receptive to the output of said demodulator and including a control terminal responsive to said signal at said known rate for controlling the rate at which said commutation filter operates; and

a comparator receptive to said analog signal and the output of said commutating filter.

4,412,349

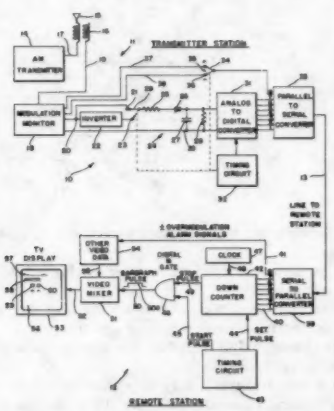
REMOTE DISPLAY OF PERCENTAGE MODULATION DATA OBTAINED AT A TRANSMITTER SITE

Charles S. Wright, Springfield, Va., assignor to Delta Electronics, Inc., Alexandria, Va.

Continuation-in-part of Ser. No. 255,345, Apr. 17, 1981, abandoned, which is a continuation of Ser. No. 129,311, Mar. 11, 1980, abandoned. This application Oct. 19, 1981, Ser. No. 313,238

Int. Cl.³ H04B 3/46, 17/00

U.S. Cl. 455—67 **8 Claims**



6. A method for remote display of percentage modulation of a broadcast transmission in the form of a modulated broadcast carrier wave measured at a transmitter site comprising continuously measuring the percentage modulation of the broadcast carrier wave at the transmitter site and producing an analog value representing percentage modulation, periodically converting the analog value to digital parallel bit data at a predetermined frequency, converting the digital parallel bit data into serial digital data form and transmitting the serial digital data through a conductor to a remote station, reconverting the serial digital data to parallel bit digital data, periodically producing a bar graph pulse at said predetermined frequency whose length corresponds to the value of said parallel bit digital data reconverted from said serial digital data form, displaying said bar graph pulse on a TV display screen as an illuminated bar graph which begins at a desired point on said TV screen corresponding to zero percentage modulation, generating scale marker pulses corresponding to scale divisions representing percentage modulation values, and producing illuminated scale markers across said TV screen parallel to said bar graph from which the percentage modulation value of said bar graph can be read.

4,412,350

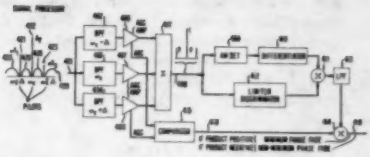
METHOD AND APPARATUS FOR DISTINGUISHING BETWEEN MINIMUM AND NON-MINIMUM PHASE FADES

Hotze Miedema, Boxford, Mass., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 30, 1981, Ser. No. 335,729

Int. Cl.³ H04B 1/10, 15/00

U.S. Cl. 455—306 **12 Claims**



1. A fade character detector for use in a radio receiver adapted to receive an incoming radio signal comprising a phase modulated double-sideband signal having a predetermined modulation rate, said phase modulated signal being amplitude modulated at said rate by fading along with having maximum amplitude attenuation at a fade notch frequency, said fade character detector being characterized by

means (e.g., **402, 403, 404, 405, 406, 407, 417, 409, 410, 411, 412, 413**) responsive to said phase modulated signal for determining an algebraic sign of the fade induced amplitude modulation;

means (e.g., **402, 404, 405, 406, 415**) responsive to said phase modulated signal for determining the location of the fade notch frequency relative to the center of the double-sideband signal frequency spectrum; and

means (e.g., **414**) responsive to the determined fade notch frequency location and the determined algebraic sign for determining when the fade is minimum phase fade and when the fade is non-minimum phase fade.

4,412,351

MICROWAVE MIXING CIRCUIT

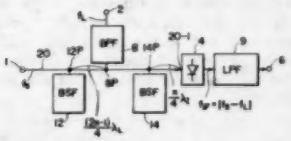
Hiroshi Onishi; Sadahiko Yamashita, and Mitsuo Makimoto, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 43,003, May 29, 1979, abandoned. This application Oct. 23, 1981, Ser. No. 314,501

Claims priority, application Japan, May 30, 1978, 53-65205

Int. Cl.³ H04B 1/26

U.S. Cl. 455—317 **12 Claims**



1. A microwave mixing circuit constructed of a microwave integrated circuit, comprising:

(a) a main transmission line having an input port at one end thereof for receiving an input high frequency, and an output port at an opposite end thereof;

(b) a band pass filter responsive to a local oscillation frequency, said band pass filter having a parallel-coupled strip line filter which is electromagnetically coupled to said main transmission line at a point between said input and output ports;

(c) a mixing diode having an input terminal connected to said output port for producing an intermediate frequency by mixing said local oscillation frequency, supplied to said

diode in one direction along a portion of said main transmission line, with said input high frequency, supplied to said diode in the same direction along said main transmission line including said main line portion; and

(d) a band stop filter for simultaneously blocking said local oscillation frequency and an image frequency, produced by said diode in response to said input high frequency and to said local oscillation frequency, said band stop filter being electromagnetically coupled to said main transmission line between said input port and said point in such a manner the the impedance at said local oscillation frequency viewed from said point toward said input port is infinite and that the impedance at said image frequency viewed from the input terminal of said mixing diode toward said point is either zero or infinite.

4,412,352

FREQUENCY CONVERSION CIRCUIT

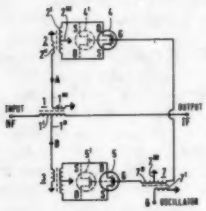
Harald Schuster, Neu-Ulm, Fed. Rep. of Germany, assignor to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Apr. 23, 1982, Ser. No. 371,477

Claims priority, application Fed. Rep. of Germany, May 13, 1981, 3118854

Int. Cl.³ H04B 1/26

U.S. Cl. 455—319 **6 Claims**



1. A circuit arrangement for converting the frequency of a high-frequency input signal into an intermediate frequency output signal by mixing with the frequency of a heterodyning oscillator, comprising in combination: an input terminal for receiving said high frequency input signal and an output terminal for providing said intermediate frequency output signal; a polarity reversing transformer having a primary winding with a center tap and, a secondary winding, said primary winding being connected between said input and said output terminals; and electronic switching means responsive to an output signal from a heterodyning oscillator for, at the frequency of the heterodyning oscillator, alternately short-circuiting and open circuiting said secondary winding and, with a 180° shift in phase, alternately short circuiting and open circuiting said center tap of said primary winding of said polarity reversing transformer.

4,412,353

MIXING CIRCUIT

Shinobu Itoh, 5-6-10-401, Shinkawa, Mitaka-shi, Tokyo, Japan

Filed Jan. 21, 1980, Ser. No. 113,978

Claims priority, application Japan, Jan. 19, 1979, 54-4971

Int. Cl.³ H04M 1/58

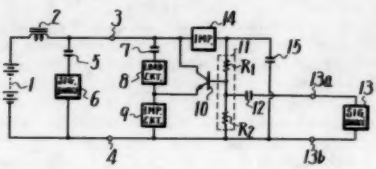
U.S. Cl. 455—323 **12 Claims**

1. A mixing circuit comprising:

(A) first and second signal sources;

(B) a series connection of a load circuit and an impedance circuit connected in parallel to said first signal source;

(C) an active element having a main current path in parallel across said load circuit and a control electrode connected to said second signal source; in which a mixed signal component of first and second signals from said first and second signal sources is derived from said load circuit,



said series connection and active element cooperating to present high impedance.

4,412,354

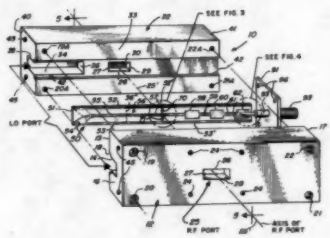
MILLIMETER-WAVE STRIPLINE PLANAR MIXER

Chi P. Hu, Santa Barbara, Calif., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 1, 1982, Ser. No. 364,289

Int. Cl.³ H04B 1/26

U.S. Cl. 455—327 **10 Claims**



1. A millimeter-wave stripline planar wide-band mixer comprising:

(a) an elongated housing member having a first end and a second end;

(b) an elongated enclosure extending from one end of said housing member to the other end thereof;

(c) an elongated flat stripline base member positioned in said elongated enclosure;

(d) a first relatively deep recess in said housing member extending from said enclosure along one side of the entire length of said stripline member;

(e) a second relatively deep recess in said housing member extending from said enclosure along a relatively short portion of the other side of said stripline member beginning at said first end of said housing member;

(f) a radio frequency (R.F.) port passing into said housing member intersecting at a right angle with said first deep recess, and also extending into said housing member a quarter wave length beyond said elongated enclosure;

(g) first planar microstrip means on said stripline base member extending from said first end of said housing member in register with said second deep recess in said housing;

(h) second planar microstrip means on said stripline base member having a first end connected to said first planar microstrip means and extending therefrom to the second end of said housing member;

(i) a matched pair of mixer diodes connected in series and also connected to said second planar microstrip means at a location substantially in register with the axis of said R.F. port;

(j) means for applying a local oscillator (L.O.) signal to said first end of said housing and to the ends of said first and second relatively deep recesses which collectively define

a local oscillator port and thus to an end of said first planar microstrip means;

(k) means for applying a R.F. signal to said R.F. port and thence to impinge on said pair of mixer diodes to thereby mix with said L.O. signal and to produce an intermediate frequency (I.F.) signal;

(l) I.F. output means attached to the other end of said housing, said I.F. output means being connected to the other end of said second planar microstrip means; and

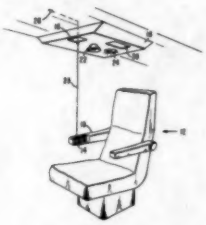
(m) filter means associated with said second planar microstrip means located between said I.F. output means and said pair of mixer diodes.

4,412,355

PUSH-BUTTON OPERATED ELECTRICAL POWER SOURCE FOR AN OPTICAL COMMUNICATION LINK

William H. Terbrack, Irvine, and Terry L. Hummel, Laguna Hills, both of Calif., assignors to Hughes Aircraft Company, El Segundo, Calif.

Filed Oct. 14, 1981, Ser. No. 311,367
Int. Cl.³ H04B 9/00
U.S. Cl. 455—603 **7 Claims**



1. A power supply, comprising:

an unmagnetized core;

a coil associated with said core and having two output terminals;

a permanent magnet;

means for oscillating said permanent magnet near said coils so as to induce a magnetic flux in said core, said core being otherwise unmagnetized;

means for permitting manual actuation of said oscillating means;

a transmitter;

a code generator associated with said transmitter;

means coupling electrical power from said coil to said transmitter and said code generator, whereby said transmitter transmits a code in synchronism with said code generator upon manual actuation of said oscillating means;

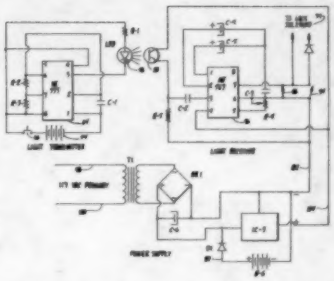
wherein said core comprises at least three legs and said permanent magnet comprises at least two legs, said coil being wound around at least one of said core legs, and said oscillating means cause said two magnet legs to face respective ones of alternate pairs of adjacent ones of said three core legs in alternate succession, whereby magnetic flux reversal through said core occurs in each motion cycle of said oscillating means.

4,412,356

LIGHT ACTUATED REMOTE CONTROL SECURITY SYSTEM

Jack C. Klaus; Larry D. Schroeder; Vincent H. Casteel, and Kenneth E. Schwartz, all of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Jan. 14, 1980, Ser. No. 112,125
Int. Cl.³ F05B 47/00; H04B 9/00; H04Q 1/00
U.S. Cl. 455—603 **4 Claims**



1. A remote control lock for a door having one side pivotally connected to one side portion of a door frame and an opposite free side closeable against an opposite side portion of the door frame, comprising,

a lock housing supported on said opposite side portion of said door frame,

a lock element supported on said housing for movement between a locked position wherein said element is advanced into the path of said door and an unlocked position wherein said element is retracted clear of the path of said door,

a lock element receiving member secured to said opposite free side of said door at a position for receiving said lock element in the locked position thereof when said door is closed, thereby to lock said door in the closed position,

bias means urging said lock element to said locked position,

an electrically actuated power means supported by said housing for moving said lock element to said unlocked position against the urging of said bias means,

a portable transmitter adapted to generate light which is interrupted at a continuously oscillating predetermined frequency,

a signal receiving circuit supported by said housing and including means for detecting said encoded light signal and verification means for determining whether said encoded light signal is interrupted generally at said predetermined frequency,

said verification means being electrically connected to said power means and operative to actuate said power means to move said lock element to said unlocked position when the frequency of the detected light signal substantially equals said predetermined frequency,

said signal receiving circuit further comprising an override switch which is manually operable to actuate said power means to retrace said lock element.

271,059

FACIAL MASK

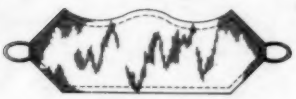
Ardath E. McKelvy, 5100 Leetsdale Dr., #125, Denver, Colo. 80222

Filed Mar. 23, 1981, Ser. No. 246,736

Term of patent 14 years

Int. Cl. D02—*03*

U.S. Cl. D2—234



271,060

SCRUBBING MITTEN

Mohammad A. Sami, 3271 Gilbert, Huntington Beach, Calif. 92649

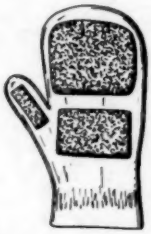
Filed Apr. 13, 1981, Ser. No. 253,990

The portion of the term of this patent subsequent to May 17, 1997, has been disclaimed.

Term of patent 14 years

Int. Cl. D02—*06*

U.S. Cl. D2—365



271,061

COMBINED BELT BUCKLE AND SNUFF BOX HOLDER

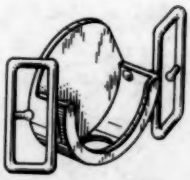
Tom Zimmerman, 1642 Apache Trail, St. Germain, Wis. 54558

Filed Jun. 10, 1981, Ser. No. 270,856

Term of patent 14 years

Int. Cl. D02—*07*

U.S. Cl. D2—400



271,062

KNITTING NEEDLE

Hidekazu Okada, Ashiya, Japan, assignor to Clover Mfg. Co., Ltd., Osaka, Japan

Filed Dec. 19, 1979, Ser. No. 105,288

Claims priority, application Japan, Nov. 12, 1979, 54-47496

The portion of the term of this patent subsequent to Jul. 19, 1997, has been disclaimed.

Term of patent 14 years

Int. Cl. D02—*07*

U.S. Cl. D3—28

271,063

VIDEO CASSETTE BOOK COVER STORAGE RECEPTACLE PACKAGE

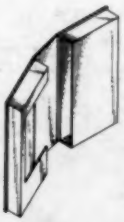
Edward M. Compton, 7116 Three Chopt Rd., Richmond, Va. 23226

Filed Feb. 27, 1981, Ser. No. 238,742

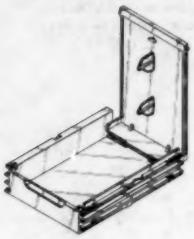
Term of patent 14 years

Int. Cl. D3—*02*

U.S. Cl. D3—35



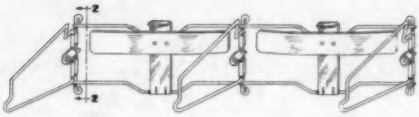
271,064
CASE FOR A MAGNETIC TAPE
Hideo Shirako, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Sep. 11, 1981, Ser. No. 301,237
Claims priority, application Japan, Jun. 16, 1981, 56-25916
Term of patent 14 years
Int. Cl. D3—*02*
U.S. Cl. D3—35



271,065
CHAIR
Robert V. Thompson, Boatyard Condominiums, 75th Ave. N., Myrtle Beach, S.C. 29577
Filed Apr. 23, 1981, Ser. No. 256,940
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—69

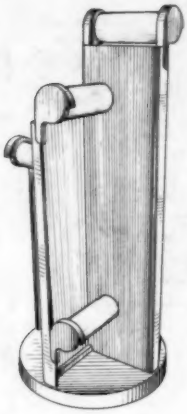
271,066
ARMCHAIR
David L. Rowland, 8 E. 62nd St., New York, N.Y. 10021
Filed Jun. 9, 1980, Ser. No. 157,960
The portion of the term of this patent subsequent to May 3, 1997, has been disclaimed.
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—72

271,067
BAG HOLDER OR THE LIKE
Randolph D. Prader, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Apr. 30, 1981, Ser. No. 259,220
Term of patent 14 years
Int. Cl. D6—*06*
U.S. Cl. D6—114



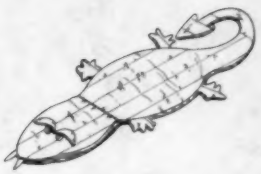
271,068
BRIDGING RAINBOW ORNAMENT FOR USE PRIMARILY BETWEEN A PAIR OF AUDIO COMPONENTS
Richard D. Williams, c/o Monte R. Williams, 2002 N. Irwin, Indianapolis, Ind. 46219
Filed Sep. 24, 1980, Ser. No. 190,488
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—151

271,069
CHAIN JEWELRY DISPLAY UNIT
Raymond J. Cuminale, New York, N.Y., and John Svezia, Millburn, N.J., assignors to Trifari, Krussman & Fishel, Inc., New York, N.Y.
Filed Jun. 8, 1981, Ser. No. 271,582
Term of patent 14 years
Int. Cl. D06—*04*
U.S. Cl. D6—186

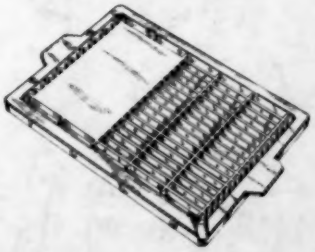


271,070
FURNITURE CORNER PROTECTOR
Douglas Durkee, 1173 Hill Crest Rd., Cincinnati, Ohio 45224
Filed Jun. 23, 1981, Ser. No. 276,466
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—191

271,071
CHILD'S SLEEPING BAG
Sarah L. Koether, 1333 E. Third Ave., Denver, Colo. 80218
Filed May 26, 1981, Ser. No. 266,807
Term of patent 14 years
Int. Cl. D6—*99*
U.S. Cl. D6—203

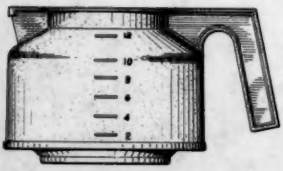


271,072
COMBINED CUTTING BOARD AND SERVING TRAY
Olaf G. Mjelde, P.O. Box 83, Old York Rd., Three Bridges, N.J. 08887
Filed May 4, 1981, Ser. No. 260,307
Term of patent 14 years
Int. Cl. D07—*04, 99*
U.S. Cl. D7—3

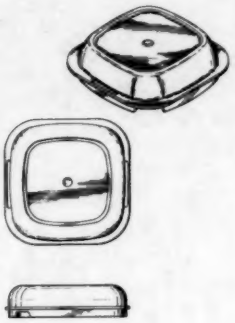


271,073
CUP HOLDER
Stanley R. Field, 2459 W. 256th St., Lomita, Calif. 90717
Filed Jul. 2, 1981, Ser. No. 279,869
Term of patent 14 years
Int. Cl. D07—*99*
U.S. Cl. D7—70

271,074
COFFEE SERVER
James E. Richardson, Weston, Conn., assignor to ACA Products, Inc., Greenwich, Conn.
Filed Dec. 15, 1980, Ser. No. 216,389
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—318

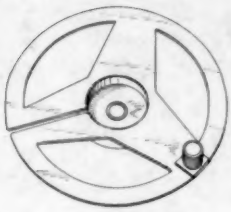


271,075
COVER FOR AN ICE CONTAINER
Robert H. C. M. Daenen, Hekelgem, Belgium, and Erik Herlow, Tikob, Denmark, assignors to Dart Industries Inc., Northbrook, Ill.
Filed Sep. 17, 1981, Ser. No. 280,684
Term of patent 14 years
Int. Cl. D07—*01*
U.S. Cl. D7—391

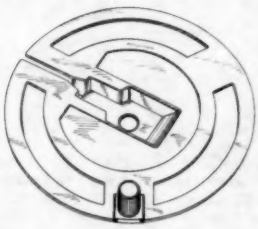


271,076
AXE HEAD
George Hillinger, Los Angeles, Calif., assignor to Alltrade, Inc., Montebello, Calif.
Filed May 4, 1981, Ser. No. 260,033
Term of patent 14 years
Int. Cl. D8—*03*
U.S. Cl. D8—76

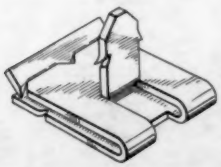
271,077
HOSE CASSETTE REEL
John R. Houghton, Skjetten, Norway, assignor to Heger Plastics A/S, Oslo, Norway
Filed Apr. 3, 1981, Ser. No. 250,673
Claims priority, application Norway, Oct. 8, 1980, 61403
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—358



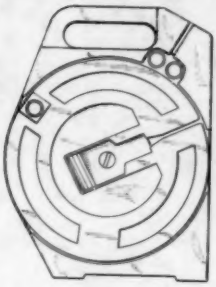
271,078
REEL FOR A HOSE CASSETTE
John R. Houghton, Skjetten, Norway, assignor to Heger Plastics A/S, Oslo, Norway
Filed Apr. 3, 1981, Ser. No. 250,674
Claims priority, application Norway, Oct. 8, 1980, 61404
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—358



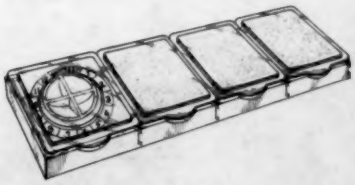
271,079
SPLASH GUARD CLIP
Douglas K. Ward, Toronto, Canada, assignor to Powerflow Inc., Buffalo, N.Y.
Filed Feb. 5, 1981, Ser. No. 231,642
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—395



271,080
HOSE CASSETTE
John R. Houghton, Skjetten, Norway, assignor to Heger Plastics A/S, Oslo, Norway
Filed Apr. 3, 1981, Ser. No. 250,675
Claims priority, application Norway, Oct. 8, 1980, 61405
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—359

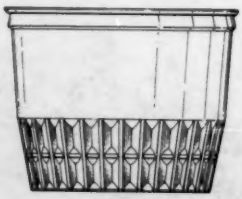


271,081
PILL CONTAINER
Terrance O. Noble, Rosemount, Minn., assignor to Quanterron, Inc., Burnsville, Minn.
Filed Jun. 8, 1981, Ser. No. 271,798
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—341



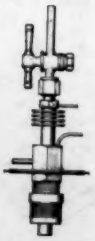
271,082
PERFUME BOTTLE
Dakota Jackson, 383 W. Broadway, New York, N.Y. 10012
Filed Jun. 12, 1981, Ser. No. 272,957
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—377

271,083
PACKAGING CUP OR THE LIKE
Frank S. Tyler, Wirral, England, assignor to Lever Brothers Company, New York, N.Y.
Filed Jun. 2, 1981, Ser. No. 269,209
Claims priority, application United Kingdom, Dec. 5, 1980, 997927
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—389

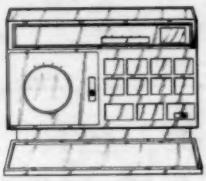


271,084
BOTTLE
William R. Gurolnick, Morton Grove, Ill., assignor to Gold Eagle Co., Chicago, Ill.
Filed Jul. 27, 1981, Ser. No. 287,275
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—389

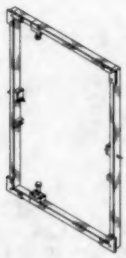
271,085
CHROMATOGRAPHIC ON-COLUMN INJECTOR
Norman W. Wohlers, Davis, and Rand G. Jenkins, Fair Oaks, both of Calif., assignors to J & W Scientific, Inc., Rancho Cordova, Calif.
Filed Apr. 27, 1981, Ser. No. 257,959
Term of patent 14 years
Int. Cl. D10—*04*; D24—*99*
U.S. Cl. D10—46



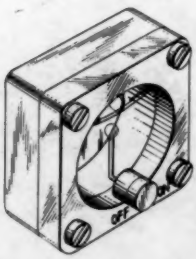
271,086
CLOCK THERMOSTAT
James A. Odom, Apple Valley, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed May 18, 1981, Ser. No. 264,267
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—50



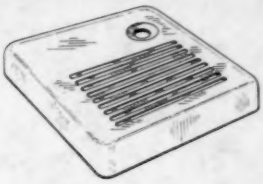
271,087
DOOR JAMB SETTER
Steve E. Gisnos, 2402 Oak St., Santa Monica, Calif. 90401
Filed Apr. 13, 1981, Ser. No. 253,694
Term of patent 14 years
Int. Cl. D8—*05*; D10—*04*
U.S. Cl. D10—61



271,088
ILLUMINATED SPIRIT LEVEL
Edwin D. Ebner, 32 John St., New City, N.Y. 10956
Filed Oct. 8, 1981, Ser. No. 309,821
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—69



271,089
SMOKE DETECTOR COVER
John Mallory, Mississauga, Canada, assignor to Isotec Industries Limited, Toronto, Canada
Filed Feb. 17, 1981, Ser. No. 234,933
Term of patent 14 years
Int. Cl. D10—*05*
U.S. Cl. D10—121

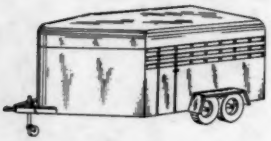


271,090
AWARD
Terrell W. Edgar, Plymouth, and James L. Quinlan, Dearborn, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Dec. 22, 1980, Ser. No. 219,028
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—131

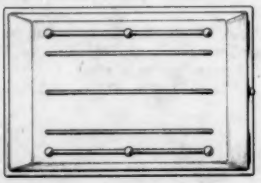
271,091
PLANTER
Paul D. Peterson, 3310 Azahar Pl., Rancho La Costa, Calif. 92008
Division of Ser. No. 74,880, Sep. 12, 1979, Pat. No. Des. 268,256. This application Jun. 24, 1982, Ser. No. 391,840
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—153

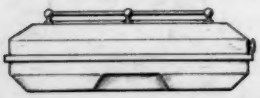
271,092
SPORTS CAR
Orville Prewitt, 65 E. Great Lakes, Apt. 7, River Rouge, Mich. 48218
Filed Nov. 17, 1980, Ser. No. 207,603
Term of patent 14 years
Int. Cl. D12—*08*
U.S. Cl. D12—92

271,093
TRAILER
Clarence Triggs, Belmond, Iowa, assignor to Triggs Manufacturing Company, Belmond, Iowa
Filed Jun. 8, 1981, Ser. No. 271,195
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—102

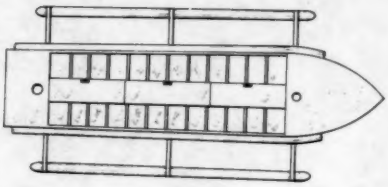


271,094
TRAILER BOX
William E. Fisher, 12634 E. 31st, Tulsa, Okla. 74145
Filed Jul. 2, 1981, Ser. No. 279,764
Term of patent 14 years
Int. Cl. D12—*10*
U.S. Cl. D12—102

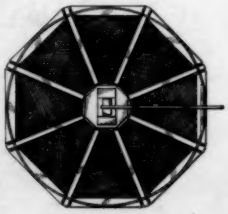




271,095
COMMANDO LANDING CRAFT
Irving D. Paster, 210 Regency West, 2 Jackson Walkway, Providence, R.I. 02903
Filed May 18, 1981, Ser. No. 264,535
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—300



271,096
FISH-BREEDING SEA VESSEL
Aulis U. Nurmi, Sirkkalankatu 27 A 29, SF-20700 Turku 70, Finland
Filed Feb. 17, 1981, Ser. No. 234,494
Claims priority, application Finland, Aug. 19, 1980, 80587
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—316

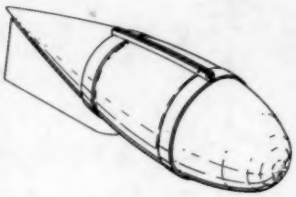


271,097

TOWABLE BUOYANT BODY

Helge Brandsaeter, Stabekk, Norway, assignor to Geophysical Company of Norway A/S, Norway

Filed Feb. 19, 1981, Ser. No. 235,957
Claims priority, application Norway, Aug. 22, 1980, 61277
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—316

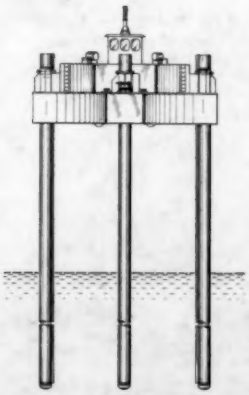


271,098

SELF-ELEVATING WELL SERVICING VESSEL FOR OFFSHORE OIL WELLS OR THE LIKE

David T. Younes, P.O. Box 7333, Abu Dhabi, United Arab Emirates

Filed Jun. 18, 1981, Ser. No. 275,134
Term of patent 14 years
Int. Cl. D12—*06*
U.S. Cl. D12—316



271,099

MODULAR CONTROL UNIT HOUSING FOR AN ELECTRICAL PROTECTION SYSTEM

Terence E. Gibbs, Pomona, N.Y., assignor to American District Telegraph Company, New York, N.Y.

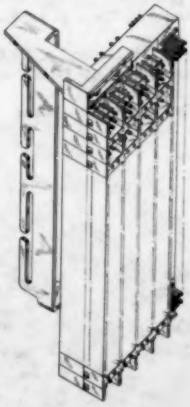
Filed Jul. 30, 1979, Ser. No. 62,005
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—12

271,100

TELEPHONE CONNECTOR BLOCK

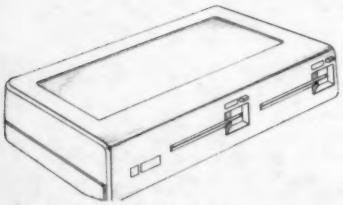
Thomas A. Hollfelder, Huntington, N.Y., assignor to Porta Systems Corp., Syosset, N.Y.

Filed Mar. 6, 1981, Ser. No. 241,030
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



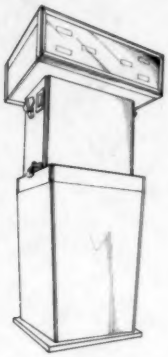
271,101
COMPUTER HOUSING
Bernard A. Grae, Fort Worth, Tex., assignor to Tandy Corp., Fort Worth, Tex.
Filed Dec. 15, 1980, Ser. No. 216,263
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—100

271,102
DUAL DISK DRIVE
Jerrold C. Manock, Palo Alto, and James R. Stewart, San Jose, both of Calif., assignors to Apple Computer, Inc., Cupertino, Calif.
Filed Aug. 24, 1981, Ser. No. 295,091
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—109

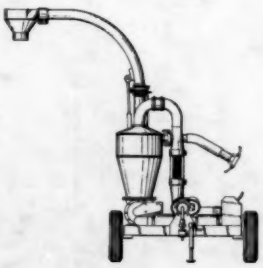


271,103
COMPUTER DISPLAY TERMINAL
Evert Endt, Paris, France, assignor to Thomson, CSF, Paris, France
Filed Jan. 21, 1981, Ser. No. 226,659
Claims priority, application World Intel. Prop. Org., Jul. 21, 1980, DM000276
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—113

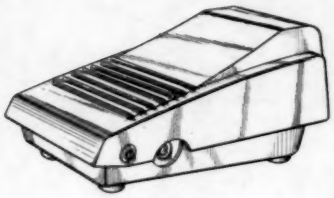
271,104
FUEL PUMP HOUSING
Bolling H. Sasnett, Jr., 80 Forest Lake Dr. N. W., Atlanta, Ga. 30327
Filed Jul. 17, 1981, Ser. No. 284,462
Term of patent 14 years
Int. Cl. D15—*02*
U.S. Cl. D15—9.2



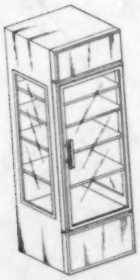
271,105
BULK MATERIAL HANDLING APPARATUS
Roy O. Christianson, and Ted T. Christianson, both of Blomkest, Minn., assignors to Christianson Systems, Inc., Blomkest, Minn.
Filed Jul. 21, 1981, Ser. No. 285,475
Term of patent 14 years
Int. Cl. D15—*03*
U.S. Cl. D15—10



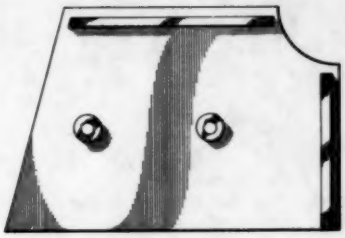
271,106
SEWING MACHINE CONTROLLER
Susumu Hanyu, Hachioji, Japan, assignor to Janome Sewing Machine Co. Ltd., Tokyo, Japan
Filed Mar. 23, 1981, Ser. No. 246,252
Claims priority, application Japan, Sep. 22, 1980, 55-38832
Term of patent 14 years
Int. Cl. D15—*99*
U.S. Cl. D15—72



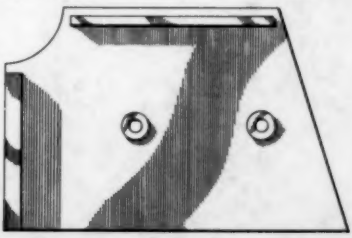
271,107
BEVERAGE COOLER
Arthur W. Trulaske, Frontenac, Mo., assignor to True Manufacturing Company, O'Fallon, Mo.
Filed Nov. 5, 1981, Ser. No. 318,411
Term of patent 14 years
Int. Cl. D15—*07*
U.S. Cl. D15—85



271,108
ABRASIVE BLASTING WHEEL LINER
W. David Watts, P.O. Box 48,166, Atlanta, Ga. 30362
Filed Apr. 22, 1981, Ser. No. 256,260
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—126

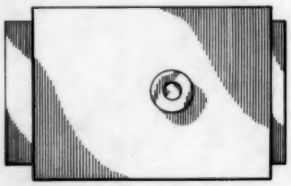


271,109
ABRASIVE BLASTING WHEEL LINER
W. David Watts, P. O. Box 48,166, Atlanta, Ga. 30362
Filed Apr. 22, 1981, Ser. No. 256,494
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—126

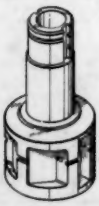


271,110
ABRASIVE BLASTING WHEEL LINER
W. David Watts, P.O. Box 48,166, Atlanta, Ga. 30362
Filed Apr. 22, 1981, Ser. No. 256,606
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—126

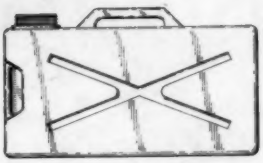
271,111
ABRASIVE BLASTING WHEEL LINER
W. David Watts, P.O. Box 48,166, Atlanta, Ga. 30362
Filed Apr. 22, 1981, Ser. No. 256,609
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—126



271,112
CHUCK BODY
James G. Wiatt; James W. Calvert; Samual L. Belcher, all of Cincinnati, and Roger D. Smith, Bethel, all of Ohio, assignors to Cincinnati Milacron Industries, Inc., Cincinnati, Ohio
Filed Jul. 13, 1981, Ser. No. 282,917
Term of patent 14 years
Int. Cl. D15—*09*
U.S. Cl. D15—140



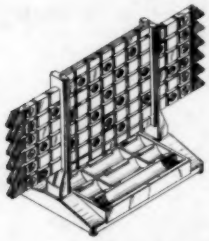
271,113
CHEMICAL CONTAINER
Stephen P. Birkeland, White Bear Lake, Minn., and Noboru Sawamura, Othu, Japan, assignors to Minnesota Mining & Manufacturing Company, St. Paul, Minn.
Filed Jul. 9, 1981, Ser. No. 281,576
Term of patent 14 years
Int. Cl. D16—*03*
U.S. Cl. D16—27



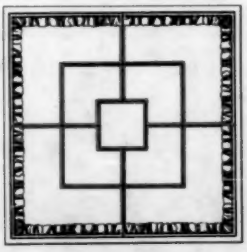
271,114
DRUMSTICK
Irvin H. Brochstein, 10706 Craighead Dr., Houston, Tex. 77025
Filed May 22, 1978, Ser. No. 908,103
Term of patent 14 years
Int. Cl. D17—*04*
U.S. Cl. D17—22

271,115
WRITING INSTRUMENT OR SIMILAR ARTICLE
Richard Luntz, P.O. Box 24234, Lyndhurst, Ohio 44124
Filed Jan. 4, 1982, Ser. No. 336,563
Term of patent 14 years
Int. Cl. D19—*06*
U.S. Cl. D19—47

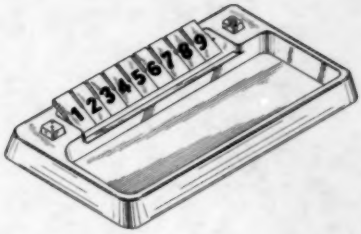
271,116
VERTICAL GAMEBOARD
William B. Burke, Sarasota, Fla., assignor to Milton Bradley International, Inc., Springfield, Mass.
Filed Sep. 21, 1981, Ser. No. 304,172
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—12



271,117
GAME BOARD
Edward J. Armstrong, P.O. Box 184, Bangor, Me. 04401
Filed Oct. 13, 1981, Ser. No. 311,024
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—34

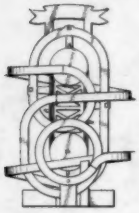


271,118
DICE GAMEBOARD
Hanns Persch, Bodenheim, Fed. Rep. of Germany, assignor to Firma Kuemmerling GmbH, Bodenheim, Fed. Rep. of Germany
Filed Jun. 10, 1981, Ser. No. 272,311
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—41

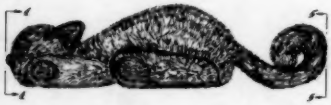


271,119
TOY VENDING MACHINE
Chun-Chiu Wong, 40-42, 10th Floor, Ta Chuen Ping St., Kwai Chung, Kowloon, Hong Kong
Filed Dec. 24, 1980, Ser. No. 219,974
Claims priority, application United Kingdom, Jun. 27, 1980, 995496
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—124

271,120
TOY TRACKWAY
Hajime Matsumoto, Chiba, and Toshihisa Suga, Saitama, both of Japan, assignors to Toybox Corporation, Tokyo, Japan
Filed Aug. 24, 1981, Ser. No. 295,625
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—143

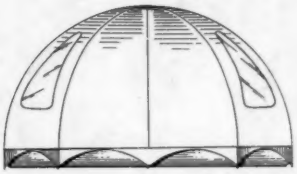


271,121
STUFFED TOY CAT OR SIMILAR ARTICLE
Francesca S. Hoerlein, 857 Castac Pl., Los Angeles, Calif. 90272
Filed Mar. 2, 1981, Ser. No. 239,557
Claims priority, application Taiwan, Jan. 24, 1981, 7030239
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—163

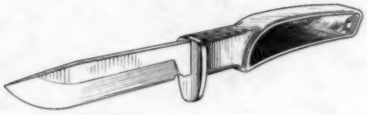


271,122
PLAY POOL
James F. Mariol, 481 Dean View Dr., Cincinnati, Ohio 45224
Filed Sep. 21, 1981, Ser. No. 303,766
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D21—252

271,123
TENT
Pierre Jutras, 111 rue de la Barre, Suite 111, Longueuil, Quebec, Canada J4K 2T8
Filed Apr. 20, 1981, Ser. No. 255,491
Term of patent 14 years
Int. Cl. D21—*04*
U.S. Cl. D21—253

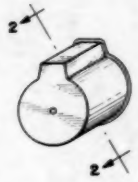


271,124
KNIFE
Robert Ferraro, Springfield, Mass., assignor to Bangor Punta Corporation, Greenwich, Conn.
Filed Sep. 21, 1981, Ser. No. 303,973
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—1



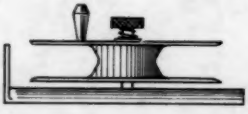
271,125
KNIFE
Robert Ferraro, Springfield, Mass., assignor to Bangor Punta Corporation, Greenwich, Conn.
Filed Sep. 21, 1981, Ser. No. 303,975
Term of patent 14 years
Int. Cl. D22—*02*
U.S. Cl. D22—1

271,126
PROTECTIVE CAP FOR GUN BARREL
Ron K. Doak, 15021 Kimberley La., Houston, Tex. 77079
Filed Nov. 13, 1981, Ser. No. 320,942
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—7

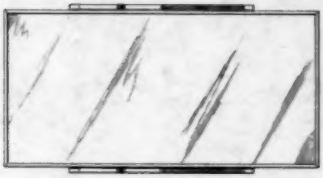


271,127
LINE GUIDE FOR FISHING ROD
Ryuichi Ohmura, Shizuoka, Japan, assignor to Fuji Kogyo Co., Ltd., Shizuoka, Japan
Filed Jul. 1, 1981, Ser. No. 279,355
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—24

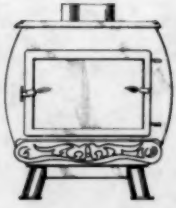
271,128
REEL FOR A FISHING ROD
Douglas D. Riis, 1720 First Ave., Marion, Iowa 52302
Filed Jul. 17, 1981, Ser. No. 284,582
Term of patent 14 years
Int. Cl. D22—*05*
U.S. Cl. D22—25



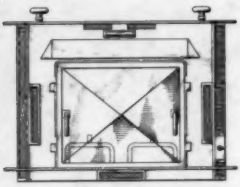
271,129
SOLAR COLLECTOR FOR A SWIMMING POOL
John Demmer, R.D. 2, Kingsley, Pa. 18826
Filed Mar. 31, 1981, Ser. No. 249,586
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—72



271,130
HEATER
Richard K. Frank, and Gerald L. Quimby, both of 18505 Clubhouse Pl., Sumner, Wash. 98390
Filed Jun. 25, 1979, Ser. No. 51,874
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



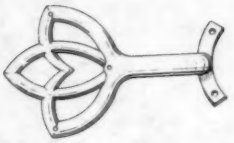
271,131
SOLID FUEL HEATING UNIT
Carrol E. Buckner, Asheville, N.C., assignor to Buck Stove Corporation, Asheville, N.C.
Filed Apr. 1, 1980, Ser. No. 136,187
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—97



271,132
PORTABLE RADIANT ELECTRIC HEATER
Melvin H. Boldt, Glenview; Thurber H. Morrison, Evanston; Robert W. Becker, Naperville, and Robert S. Huff, Oak Park, all of Ill., assignors to National Presto Industries, Inc., Eau Claire, Wis.
Filed Apr. 8, 1981, Ser. No. 252,190
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—123

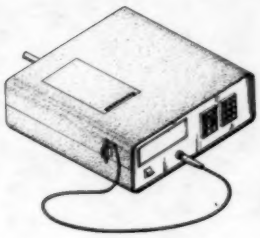
271,133
PORTABLE FAN HOUSING
Robert Pataki, Burwood, Australia, assignor to Kemtron Properties Pty. Ltd., Australia
Filed Mar. 4, 1982, Ser. No. 354,739
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—155

271,134
HOLDER FOR THE BLADE OF A CEILING FAN
Yau Yung, Chai Wan, Hong Kong, assignor to Shell Electric Manufacturing Company Limited, Chai Wan, Hong Kong
Filed Feb. 26, 1982, Ser. No. 352,872
Claims priority, application United Kingdom, Oct. 28, 1981, 1003261
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—163

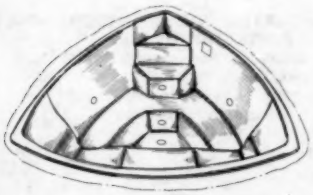


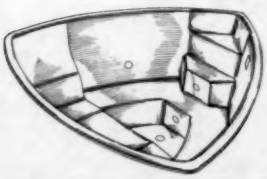
271,135
LARYNGOSCOPE
Gordon M. Greenblatt, 5533 N. Third St., Private Dr., Phoenix, Ariz. 85073
Filed Aug. 21, 1981, Ser. No. 295,119
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

271,136
ULTRASONIC OCULAR BIOMETRY UNIT
Arthur E. Bollinger, St. Louis County, and Kenneth O. Head, St. Louis, both of Mo., assignors to Teknar, Inc., Fenton, Mo.
Filed Oct. 23, 1981, Ser. No. 314,112
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—17

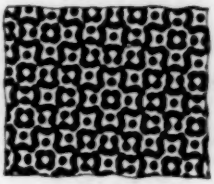


271,137
HYDROTHERAPY SPA
Herbert V. Kohler, Jr., Kohler, and Robert C. Giese, Jr., Sheboygan, both of Wis., assignors to Kohler Company, Kohler, Wis.
Filed May 8, 1981, Ser. No. 261,960
Term of patent 14 years
Int. Cl. D24—*01*; D23—*02*
U.S. Cl. D24—38

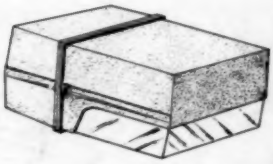




271,138
LIGHT TRANSMITTING PANEL
Frank A. Sportelli, 7 Redwood Ct., Glen Cove, N.Y. 11542
Filed Aug. 11, 1981, Ser. No. 292,088
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—72

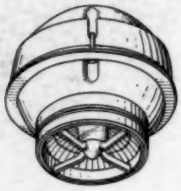


271,139
LUMINAIRE
Hendrik A. J. deVos, Swansea, Mass., assignor to GTE Products Corporation, Stamford, Conn.
Filed Mar. 4, 1981, Ser. No. 240,448
Term of patent 14 years
Int. Cl. D26—*03*
U.S. Cl. D26—24

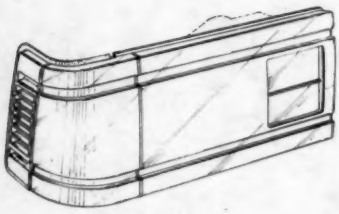


271,140
PORTABLE LANTERN
Paul Thom, Quincy, Mass., assignor to Ray-O-Vac Corporation, Madison, Wis.
Filed Jul. 13, 1981, Ser. No. 282,385
Term of patent 14 years
Int. Cl. D26—*02*
U.S. Cl. D26—42

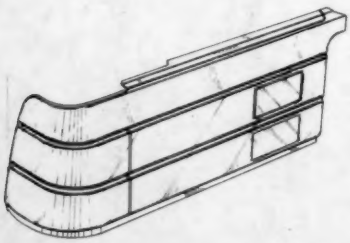
271,141
ADJUSTABLE LIGHT
Herbert E. Seymour, Chatsworth, and Philip Sacks, Van Nuys, both of Calif., assignors to Xantech Corporation, North Hollywood, Calif.
Filed Aug. 2, 1982, Ser. No. 404,576
Term of patent 14 years
Int. Cl. D26—*05*
U.S. Cl. D26—74



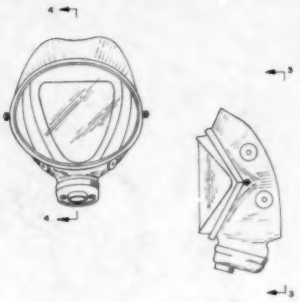
271,142
COMBINED AUTOMOBILE TAILLIGHT LENS AND GRILL
Eiji Hirasawa, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Sep. 30, 1982, Ser. No. 430,118
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—120



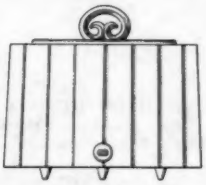
271,143
COMBINED AUTOMOBILE TAILLIGHT LENS AND COVER
Masatoshi Hirakawa, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Sep. 30, 1982, Ser. No. 430,123
Term of patent 14 years
Int. Cl. D26—*06*
U.S. Cl. D26—120



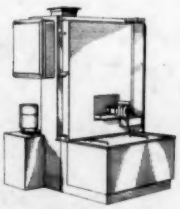
271,144
BREATHING GAS MASK
Donald L. Gadberry, Huntington Beach, Calif., assignor to U.S.D. Corp., Santa Ana, Calif.
Filed Jul. 6, 1981, Ser. No. 280,689
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D29—9



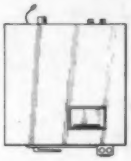
271,145
JEWELRY CLEANER
John J. McNaughton, Newport Beach, Calif., assignor to McJaf Enterprises, Costa Mesa, Calif.
Filed Jun. 1, 1981, Ser. No. 268,800
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—1



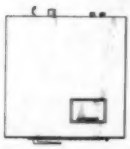
271,146
CLEANING APPARATUS FOR AUTOMOTIVE ENGINE PARTS AND THE LIKE
Bero Burghard, and Helmut Schauer, both of 1243 Dorion St., Montreal, Quebec, Canada H2K 4A2
Filed Jan. 19, 1981, Ser. No. 226,530
Term of patent 14 years
Int. Cl. D15—*99, 05*
U.S. Cl. D32—4



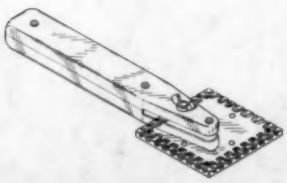
271,147
COIN OPERATED COMMERCIAL WASHER
Howard Krebs, 9 Briarwood Dr., Glen Cove, N.Y. 11542
Filed May 21, 1981, Ser. No. 265,836
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—6



271,148
COMMERCIAL WASHER
Howard Krebs, 9 Briarwood Dr., Glen Cove, N.Y. 11542
Filed May 22, 1981, Ser. No. 266,172
Term of patent 14 years
Int. Cl. D15—*05*
U.S. Cl. D32—6

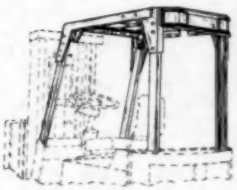


271,149
ICE SCRAPER
William F. Castiglione, Denver, Colo., assignor to Polaroid Corporation, Cambridge, Mass.
Filed Sep. 15, 1980, Ser. No. 187,331
Term of patent 14 years
Int. Cl. D7—*05*
U.S. Cl. D32—48

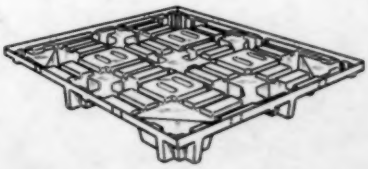


271,150
WINCH
Paul D. Cavanagh, 495 Newbury St., Danvers, Mass. 01923
Filed May 26, 1981, Ser. No. 266,909
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—33

271,151
OVERHEAD GUARD FOR A LIFT TRUCK
Robert L. Kirby; Warner K. Brown, and Deryl R. Hoyt, all of Battle Creek, Mich., assignors to Clark Equipment Company, Buchanan, Mich.
Filed May 22, 1981, Ser. No. 266,033
Term of patent 14 years
Int. Cl. D12—*05*
U.S. Cl. D34—35



271,152
PALLET
Joseph H. Wind, Taylors, S.C., assignor to Bigelow-Sanford, Inc., Greenville, S.C.
Filed Jan. 28, 1981, Ser. No. 229,196
Term of patent 14 years
Int. Cl. D09—*08*
U.S. Cl. D34—38



271,153

TOTE BOX

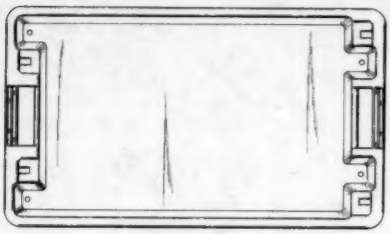
Thomas P. Deaton, Mason, Ohio, assignor to Nestier Corporation, Cincinnati, Ohio

Filed Apr. 17, 1981, Ser. No. 250,651

Term of patent 14 years

Int. Cl. D9—*04*

U.S. Cl. D34—40



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF OCTOBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Aanstoot, Jan; and Oude Elberink, Bernard H. M., to Hollandse Signaalapparaten B.V. Digital scan converter. 4,412,220., Cl. 343-55.00C.

Abbott, Ned E.; Keshavan, Hampapur R.; and McGuire, Robert J., to Rockwell International Corporation. Muldem with improved monitoring and control system. 4,412,323., Cl. 370-16.000.

Abbott, Thomas I.; and Jones, Cynthia, to Eastman Kodak Company. Radiographic elements exhibiting reduced crossover. 4,411,986., Cl. 430-502.000.

Abdelhamid, Amr N.: *See*—
Traver, Darwin G.; Anderson, Carl M.; and Abdelhamid, Amr N., 4,411,592., Cl. 415-119.000.

Abdulla, Riaz F., to Eli Lilly and Company. Synthesis of 6-t-alkyl-3-pyridazinones. 4,411,753., Cl. 204-158.00R.

Abe, Katsuhiro: *See*—
Takahashi, Hiroshi; and Abe, Katsuhiro, 4,412,044., Cl. 525-329.500.

Abel, Irving R.; and Hatch, Marcus R., to Honeywell Inc. Compact optical system. 4,411,499., Cl. 350-442.000.

Abeta, Sadaharu: *See*—
Hashizume, Shuhei; Abeta, Sadaharu; Ohmae, Tadayuki; and Nishibara, Hajime, 4,411,666., Cl. 8-455.000.

Abex Corporation: *See*—
Beetle, Robert H., 4,411,305., Cl. 164-529.000.

Ableitner, Erich; Conrad, Ulrich; Derndinger, Hans-Otto; and Niemeier, Gerd, to Daimler-Benz AG. Drive mechanism for fuel injection pumps of an internal combustion engine. 4,411,237., Cl. 123-501.000.

Acker, Jesse L.: *See*—
Meserol, Peter M.; and Acker, Jesse L., 4,411,518., Cl. 356-39.000.

Ackland, Bryan D.; and Weste, Neil H. E., to Bell Telephone Laboratories, Incorporated. Random access memory system having high-speed serial data paths. 4,412,313., Cl. 365-221.000.

Adachi, Hiroyuki; and Taniishi, Shinnosuke, to Canon Kabushiki Kaisha. Original illumination apparatus. 4,411,516., Cl. 355-67.000.

Adachi, Keiichi: *See*—
Kobayashi, Hidetoshi; Watanabe, Toshiyuki; Adachi, Keiichi; and Ogawa, Tadashi, 4,411,987., Cl. 430-542.000.

Adelbratt, Kurt, to Aktiebolaget SKF. Device for providing a friction joint. 4,411,551., Cl. 403-370.000.

Adidas - Fabrique de Chassures de Sport: *See*—
Kreyenbuhl, Armand, 4,411,445., Cl. 280-615.000.

Adnovum AG: *See*—
Lauchenauer, Alfred E., 4,411,663., Cl. 8-107.000.

Advanced Cardiovascular Systems, Inc.: *See*—
Simpson, John B.; and Robert, Edward W., 4,411,055., Cl. 29-447.000.

Advanced Fuel Systems: *See*—
Middleton, Harold G., 4,411,234., Cl. 123-485.000.

Advanced Micro Devices, Inc.: *See*—
Alfke, Peter H.; and Stauffer, Michael K., 4,412,339., Cl. 375-95.000.

Aftergut, Siegfried; and Cole, Herbert S., to General Electric Company. Dichroic liquid crystal compositions made with asymmetric tris-azo dyes. 4,411,812., Cl. 252-299.100.

Agarwal, Suresh C.; Jager, Horst; Podder, Nitya G.; and Mollet, Hans, to Ciba-Geigy Corporation. Liquid dyestuff preparations. 4,411,668., Cl. 8-527.000.

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Sakamoto, Tsunenori, 4,411,728., Cl. 156-606.000.

AGFA-Gevaert N.V.: *See*—
Laridon, Urbain L.; Kokelenberg, Hendrik E.; and Samijn, Rafael P., 4,411,978., Cl. 430-157.000.

Aggregates Equipment, Inc.: *See*—
Morrow, Harold F., Jr., 4,411,578., Cl. 414-300.000.

Agius, Frank P. Tubular key cutting machine. 4,411,567., Cl. 409-82.000.

Agricultural Computer Systems, Inc.: *See*—
Wright, Thad F., 4,411,274., Cl. 128-738.000.

Aikman, Floyd O. Trigger mechanism for firearms. 4,411,087., Cl. 42-69.00A.

Aine, Harry E. Thin film recording and method of making. 4,411,963., Cl. 428-622.000.

Air Products and Chemicals, Inc.: *See*—
Bennett, Douglas L.; and Amoss, Donald C., 4,411,756., Cl. 204-176.000.
Cebalo, Tony; and Walde, Robert A., 4,412,079., Cl. 548-141.000.
Garg, Diwakar; and Givens, Edwin N., 4,411,766., Cl. 208-10.000.
Garg, Diwakar, 4,411,767., Cl. 208-10.000.
Pervier, James W.; Vines, Harvey L.; Marano, Vincent, III; and Patterson, Michael A., 4,411,677., Cl. 62-25.000.

Airco, Inc.: *See*—
Marancik, William G., 4,411,712., Cl. 148-11.50Q.

Aisin Kako Kabushiki Kaisha: *See*—
Sakabe, Toshiaki; Matsumoto, Yasuhiro; and Tsujio, Hisami, 4,411,851., Cl. 264-137.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Inada, Masami; and Nomura, Isshi, 4,411,406., Cl. 251-129.000.
Kawai, Shinji; Suzuki, Koichi; and Yamaguchi, Yuji, 4,411,030., Cl. 4-443.000.
Nishida, Koji; and Kawai, Taneichi, 4,411,208., Cl. 112-103.000.
Sakabe, Toshiaki; Matsumoto, Yasuhiro; and Tsujio, Hisami, 4,411,851., Cl. 264-137.000.

Ajinomoto Company Incorporated: *See*—
Shimazaki, Keishi; Nakamura, Yoshihiro; and Yamada, Yasutsugu, 4,411,997., Cl. 435-115.000.

Akao, Mutsuo, to Fuji Photo Film Co., Ltd. Friction sheet. 4,411,943., Cl. 428-161.000.

Akao, Mutsuo; and Furuta, Haruo, to Fuji Photo Film Co., Ltd. Friction sheets. 4,411,945., Cl. 428-216.000.

Akazawa, Yukio; Matsuya, Yasuyuki; and Iwata, Atsushi, to Nippon Telegraph & Telephone Public Corporation. Digital to analog converter. 4,412,208., Cl. 340-347.0DA.

Akimoto, Osamu: *See*—
Kunita, Shizuo; Akimoto, Osamu; Sugie, Osamu; Iyoda, Michio; and Suzuki, Kazuo, 4,411,247., Cl. 123-655.000.

Akiyama, Yoshinori: *See*—
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Aktiebolaget Bofors: *See*—
Gustavsson, Olle, 4,411,188., Cl. 89-20.00A.

Aktiebolaget SKF: *See*—
Adelbratt, Kurt, 4,411,551., Cl. 403-370.000.

Akzo N.V.: *See*—
Hageman, Hendrik J.; Giezen, Egenius A.; and Jansen, Leonardus G. J., 4,411,822., Cl. 502-168.000.
Hageman, Hendrik J.; de Klein, Willem J.; and Giezen, Egenius A., 4,411,823., Cl. 502-168.000.

Akzona Incorporated: *See*—
Seibert, Karl; Praetorius, Heinz; and Poppel, Gunter, 4,411,887., Cl. 424-78.000.

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Albee, Paul J., Jr.; Burdick, Patricia E.; and Wrozina, Joseph L., to Allied Corporation. Low molecular weight copolymer salts as lubricants in plastics. 4,412,040., Cl. 525-143.000.

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Fiebig, August E., Jr.; Shurney, Glenn A.; and Nagy, Anton J., 4,411,855., Cl. 264-219.000.

Alberts, Heinrich; Friemann, Hans; Moretto, Hans-Heinrich; Sattleger, Hans; and Mietzsch, Fritz, to Bayer Aktiengesellschaft. Cross-linked silicone-vinyl polymer systems. 4,412,039., Cl. 525-106.000.

Albrecht, Joachim; Duerig, Thomas; and Schroeder, Gunther, to BBC Brown, Boveri & Company Limited. Process to produce a reversible two-way shape memory effect in a component made from a material showing a one-way shape memory effect. 4,411,711., Cl. 148-11.50A.

Albrecht, William L.; and Jones, Winton D., to Richardson-Merrell Inc. Antisecretory 1,2,4-triazole-3-thiols. 4,411,905., Cl. 424-269.000.

Alcan Aluminum Corporation: *See*—
Gailey, J. Lynn; and Wollam, Carl A., 4,411,215., Cl. 118-111.000.
Wollam, Carl A.; Gailey, J. Lynn; and Chalmers, Alexander F., 4,411,218., Cl. 118-411.000.

Alcon Laboratories, Inc.: *See*—
Kwan, Stephen C., 4,411,932., Cl. 427-164.000.

Alcott, David K., to Hsulamatic Corporation. Log splitter. 4,411,299., Cl. 144-193.00R.

Alderman, Paul. Golf ball retrieving rake. 4,411,463., Cl. 294-19.00A.

Alexander, Harold; Parsons, John R.; Strauchler, Irving D.; and Weiss, Andrew B., to University of Medicine and Dentistry of New Jersey. Bio-absorbable composite tissue scaffold. 4,411,027., Cl. 3-1.000.

Alexeff, Igor. Maser. 4,412,150., Cl. 315-4.000.

Alfke, Peter H.; and Stauffer, Michael K., to Advanced Micro Devices, Inc. Zero-crossing interpolator to reduce isochronous distortion in a digital FSK modem. 4,412,339., Cl. 375-95.000.

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Allegheny Ludlum Steel Corporation: *See*—
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Allen, Albert H.: *See—*
Golden, Neil S., 4,411,112., Cl. 52-288.000.

Allen, David T.: *See—*
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Allen, Nina S.: *See—*
Allen, Robert D.; and Allen, Nina S., 4,412,246., Cl. 358-107.000.

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Allied Corporation: *See—*
Albee, Paul J., Jr.; Burdick, Patricia E.; and Wrozina, Joseph I., 4,412,040., Cl. 525-143.000.
Anello, Louis G.; Eibeck, Richard E.; and Robinson, Martin A., 4,411,843., Cl. 260-544.00Y.

Allsop, Jon I.: *See—*
Stern, Donald J.; and Allsop, Jon I., 4,411,387., Cl. 239-345.000.

Altus Corporation: *See—*
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Alumasc Limited: *See—*
Hyde, Roger J., 4,411,287., Cl. 137-315.000.

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Dawless, Robert K.; Bowman, Kenneth A.; Mazgaj, Robert M.; and Cochran, C. Norman, 4,411,747., Cl. 204-67.000.

Amann, Herbert; and Morlock, Gerhard, to Degussa Aktiengesellschaft. Process for the continuous polymerization or copolymerization of trioxane. 4,412,067., Cl. 528-232.000.

Amberg, Robert L.; and Gaseor, Thomas J., to Boeing Company, The. Brake torque control system. 4,412,291., Cl. 364-426.000.

Amchem Products, Inc.: *See—*
Nishida, Takao; and Hirohata, Takashi, 4,411,937., Cl. 427-435.000.
Smith, Timothy J. C., 4,411,950., Cl. 428-327.000.

American Cyanamid Company: *See—*
Bambrick, William E.; and Goldstein, Marvin S., 4,411,771., Cl. 208-112.000.
Loffelman, Frank F.; and Hoffman, Joseph A., 4,412,020., Cl. 524-100.000.
Shepherd, Robert G., 4,411,903., Cl. 424-267.000.
Smith, Frank H., Jr.; and Mookerjee, Pradip K., 4,411,694., Cl. 71-118.000.

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Lautzenheiser, William J.; Simonetti, Richard A.; Henderson, Martin E.; Edson, James B.; and Beeson, Kenneth E., 4,412,211., Cl. 340-514.000.

American Hospital Supply Corporation: *See—*
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Ametek, Inc.: *See—*
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AMF Incorporated: *See—*
Bos, Peter J., 4,411,139., Cl. 62-126.000.

Ammann, Hans H.; Bonanni, Rocco; and Engelmaier, Werner, to Bell Telephone Laboratories, Incorporated. Laminated electric heat generating member for reflow soldering devices. 4,412,123., Cl. 219-233.000.

Ammermann, Eberhard: *See—*
Zeeh, Bernd; Goetz, Norbert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,411,687., Cl. 71-76.000.

Amoss, Donald C.: *See—*
Bennett, Douglas L.; and Amoss, Donald C., 4,411,756., Cl. 204-176.000.

AMP Incorporated: *See—*
Casey, Daniel T., 4,411,484., Cl. 339-97.00C.
Folk, Kenneth F.; and Jackson, Mark F., 4,411,062., Cl. 29-749.000.
McCarty, Patrick R., 4,412,108., Cl. 200-5.00R.

AMSTED Industries Incorporated: *See—*
Gain, Lorand H., Jr., 4,411,288., Cl. 137-363.000.

An, Byung H., to Interstate Electronics Corporation. Audio signal recognition computer. 4,412,098., Cl. 381-43.000.

Anders, Walter G., to Diebold Incorporated. Railway transport banking system. 4,411,336., Cl. 186-37.000.

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Traver, Darwin G.; Anderson, Carl M.; and Abdelhamid, Amr N., 4,411,592., Cl. 415-119.000.

Anderson, James Y. Powder flame spraying apparatus and method. 4,411,935., Cl. 427-318.000.

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Ando, Akio: *See—*
Komatsu, Michiyasu; Tsuge, Akihiko; Komeya, Katsutoshi; and Ando, Akio, 4,412,009., Cl. 501-97.000.

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Angersbach, Wolfgang; and Schuler, Peter, to Quick-Rotan Elektromotoren GmbH. Positioning drive. 4,412,163., Cl. 318-567.000.

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Applegate, Robert D., to Driall, Inc. Grain drier and method of drying grain. 4,411,620., Cl. 432-29.000.

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Arata, Tetsuya: *See—*
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Arbeeny, John. Electrical switch. 4,412,114., Cl. 200-61.080.

Ariyama, Kenzo; and Hirose, Akira, to Ricoh Company, Ltd. Image transfer material separation and transportation apparatus for electrophotographic copying apparatus. 4,411,511., Cl. 355-3.0TR.

Arken, Inc.: *See—*
Farmer, Ian W., 4,411,085., Cl. 40-610.000.

Armco Inc.: *See—*
Hinman, P. Anthony, 4,412,064., Cl. 528-9.000.

Armour and Company: *See—*
Theiler, Richard F., 4,411,922., Cl. 426-266.000.

Armstrong World Industries, Inc.: *See—*
Duong, Chau H., 4,411,931., Cl. 427-54.100.
Valenti, James P., 4,411,217., Cl. 118-212.000.

Arnett, David W.: *See—*
Davis, Charles P.; Warren, Michael M.; and Arnett, David W., 4,411,648., Cl. 604-21.000.

Arod, Jean; Bartoli, Bernard; Bergez, Pierre; Biedermann, Jean; Caminade, Philippe; Martinet, Jean-Marie; Maurin, Jean; and Rossarie, Jean, to Commissariat a l'Energie Atomique; and Compagnie Francaise de Raffinage. Process for the treatment of a hydrocarbon charge by high temperature ultrafiltration. 4,411,790., Cl. 210-637.000.

Asada, Masahiro; Matsuura, Miyuki; and Yonezawa, Kazuya, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Process for manufacturing aromatic polyesters. 4,412,057., Cl. 528-179.000.

Asahi Glass Company Ltd.: *See—*
Sato, Kimihiko; Sajima, Yasuo; Nakao, Makoto; and Morimoto, Takeshi, 4,411,749., Cl. 204-98.000.
Yamabe, Masaaki; Kato, Masao; and Takakura, Teruo, 4,412,054., Cl. 528-70.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Kato, Michio; Endo, Toshiyuki; and Nomura, Junji, 4,411,793., Cl. 210-656.000.

Asahi Yukizai Kogyo Co., Ltd.: *See—*
Ninomiya, Youichi; and Tsuno, Kazuhiko, 4,411,407., Cl. 251-315.000.

Asakura, Osamu: *See—*
Nozaki, Mineo; Nagashima, Masasumi; and Asakura, Osamu, 4,411,540., Cl. 400-175.000.

Asakura, Toshio: *See—*
Blume, Horst K.; and Asakura, Toshio, 4,411,523., Cl. 356-246.000.

Asano, Kiyomitsu; Kondo, Toshikatsu; and Mizuno, Shigeru, to Brother Kogyo Kabushiki Kaisha; and Nippon Telecommunication Eng. Co. Print-head of a dot-printer. 4,411,538., Cl. 400-124.000.

Aschauer, Hans; and Funk, Gunter, to Voest-Alpine Aktiengesellschaft. Press brake. 4,411,148., Cl. 72-306.000.

ASEA Aktiebolag: *See—*
von Renteln, Adrian, 4,412,199., Cl. 336-70.000.

Ashland Oil, Inc.: *See—*
Gruber, Bruce A.; Koch, Diether; Langer, Heimo J.; and Dunnavant, William R., 4,412,088., Cl. 585-23.000.

Asjes, Ronald J.; van Peppen, Jacobus C. L.; and Klaassen, Klaas B., to De Regt Special Cable B.V. Transducer for picking up mechanical vibrations, in particular seismic waves, and a seismic measuring system including such a transducer. 4,412,317., Cl. 367-185.000.

Atago, Takeshi; and Manaka, Toshio, to Hitachi, Ltd. Method of controlling air-fuel ratio in internal combustion engine. 4,411,232., Cl. 123-438.000.

Atlantic Richfield Company: *See—*
DeVries, Donald L.; and DeJovine, James M., 4,411,804., Cl. 252-29.000.
Ecker, Amir L., 4,411,307., Cl. 165-70.000.

Au Clair, Christopher J.: *See—*
Lu, Chin H.; Au Clair, Christopher J.; and Erhardt, Peter F., 4,411,974., Cl. 430-106.000.
Lu, Chin H.; and Au Clair, Christopher J., 4,411,975., Cl. 430-106.000.

Auer, Mark J. Apparatus for cutting pie-shaped openings in fiberboard duct. 4,411,183., Cl. 83-581.000.

Auld, David L.; and Miller, Herbert W., to Texaco Inc. Mechanical means for securing a screen holding caulking in a groove and methods. 4,411,782., Cl. 210-230.000.

Aulisio, Callixtus: *See—*
Ehrlich, Shelton; and Aulisio, Callixtus, 4,411,879., Cl. 423-640.000.

Austin, Paul E.: *See—*
Allcock, Harry R.; and Austin, Paul E., 4,412,066., Cl. 528-168.000.

Avar, Lajos; Kalt, Evelyne; and Reinshagen, Hellmuth, to Sandoz Ltd. Concentrated solutions of aromatic oxamide stabilizers. 4,412,024., Cl. 524-220.000.

Awaji, Hidekazu, to Sharp Kabushiki Kaisha. Photo coupler device molding including filler particles. 4,412,135., Cl. 250-551.000.

Axelsson, Per A. T. Device for applying toothpaste. 4,411,623., Cl. 433-80.000.

Aydin, Kemal, to Kadex, Inc. Electronic lock system. 4,411,144., Cl. 70-278.000.

Azzola, Roberto, to Saiag S.p.A. Industria Articoli Gomma. Sealing strip for vehicle bodies. 4,411,941., Cl. 428-122.000.

Baba, Shigenori: *See*—
Kikuchi, Hideo; Baba, Shigenori; and Sato, Shoji, 4,412,240., Cl. 357-45.000.

Babb, Albert L., to Trimedyne, Inc. Lymph filtration system. 4,411,792., Cl. 210-651.000.

Babcock & Wilcox Company, The: *See*—
Kaya, Azmi; Keyes, Marion A.; and Scheib, Thomas J., 4,412,136., Cl. 290-40.00R.

Babin, Eugene R.; and Drago, William R. Contamination-free transfer and purge apparatus. 4,411,157., Cl. 73-864.810.

Bachelis, Leonid V.: *See*—
Zitser, Vitaly A.; Bachelis, Leonid V.; Melnikov, Alexandr V.; Dreishev, Igor I.; Shishkin, Nikolai K.; Morozov, Jury E.; Ivanov, Vladimir A.; Olshansky, Semen A.; and Ryabinin, July V., 4,411,586., Cl. 414-728.000.

Bader, Leonhard: *See*—
Weber, Helmut; Reitberger, Peter H.; Bader, Leonhard; and Konig, Walter, 4,412,232., Cl. 346-140.00R.

Badesha, Santokh S., to Xerox Corporation. Process for reclaimation of high purity selenium, tellurtum, and arsenic from scrap alloys. 4,411,698., Cl. 75-121.000.

Bailey, David C.; and Klein, Robert E., to Harris Corporation. Air-platen bearing. 4,411,503., Cl. 352-222.000.

Bailey, Fred J.: *See*—
McAleer, William J.; Bailey, Fred J.; and Markus, Henry Z., 4,412,002., Cl. 435-237.000.

Bailey, Herbert C. Support for facilitating reading of an electric meter. 4,412,271., Cl. 361-370.000.

Baker International Corporation: *See*—
Carmody, Michael A., 4,411,316., Cl. 166-323.000.
McStravick, David M., 4,411,435., Cl. 277-9.500.

Baker, Randy S.; and Price, H. R., to Hughes Tool Company. Drag spring unit. 4,411,315., Cl. 166-187.000.

Baldwin, A. Frank, to Burlington Industries, Inc. Process for applying a water and alcohol repellent microbiocidal finish to a fabric and product so produced. 4,411,928., Cl. 427-2.000.

Baldwin, John J.; and Lumma, William C., Jr., to Merck & Co., Inc. Substituted derivatives of amino alkane diols as gastric secretion inhibitors. 4,411,899., Cl. 424-246.000.

Baldwin, Thomas O.; and Holzman, Thomas F., to University of Illinois, Board of Trustees of The. Isolation of bacterial luciferase. 4,412,001., Cl. 435-189.000.

Bales, Thomas T.: *See*—
McWithey, Robert R.; Royster, Dick M.; and Bales, Thomas T., 4,411,380., Cl. 228-181.000.

Ball, Gerald G., to Peabody Holmes Limited. Liquid seal valve. 4,411,286., Cl. 137-253.000.

Ball, Lawrence E.; Pichler, Martin A.; and Gaylor, V. Frances, to Standard Oil Company, The. Electrolytic initiation of polymerization in aqueous two-phase systems. 4,411,745., Cl. 204-59.00R.

Ball, Lawrence E.: *See*—
Wu, Mu-Yen M.; and Ball, Lawrence E., 4,412,061., Cl. 528-315.000.

Ball, Robert D.: *See*—
Russell, William H.; and Ball, Robert D., 4,412,202., Cl. 337-171.000.

Bally Manufacturing Corporation: *See*—
Nicolaus, Frank G., 4,411,428., Cl. 273-143.00R.

Bambrick, William E.; and Goldstein, Marvin S., to American Cyanamid Company. Process for hydrotreating heavy hydrocarbons and catalyst used in said process. 4,411,771., Cl. 208-112.000.

Bannou, Masahiko: *See*—
Watanabe, Yasuo; Isoyama, Seiji; and Bannou, Masahiko, 4,411,807., Cl. 252-62.580.

Barakitis, Nikolaos; and Cohen, Sheppard, to GTE Products Corporation. Discharge lamp with bimetal starter. 4,412,152., Cl. 315-73.000.

Barbe, Pierre L. C. C., to Pont-A-Mousson S.A. Butterfly-valve. 4,411,405., Cl. 251-306.000.

Barbini, Mario: *See*—
Tironi, Maurizio G.; Barbini, Mario; and Del Sere, Giannetto, 4,412,334., Cl. 373-40.000.

Barels, Ronald R.; and Ghinazzi, Daniel J. Vitamin E oil based dentifrice. 4,411,885., Cl. 424-52.000.

Barnes, George H.; Lundstrom, Stephen F.; and Shafer, Philip E., to Burroughs Corporation. Array processor architecture. 4,412,303., Cl. 364-900.000.

Barnett, Robert V. Weight lifting exercise apparatus. 4,411,424., Cl. 272-118.000.

Barr & Stroud Limited: *See*—
Neil, Iain A., 4,411,488., Cl. 350-1.400.

Barsotti, Robert J., to Du Pont de Nemours, E. I., and Company. High solids coating composition of an enamel containing a rheology control additive of silica and polyethylene glycol. 4,411,951., Cl. 428-328.000.

Barthelmess, Casey E. Cutting torch guide attachment. 4,411,411., Cl. 266-66.000.

Bartlett, Marion C.; and Johnson, Raymond C., to United States of America, Army. One-bit autocorrelation envelope detector. 4,412,340., Cl. 375-96.000.

Bartoli, Bernard: *See*—
Arod, Jean; Bartoli, Bernard; Bergez, Pierre; Biedermann, Jean; Caminade, Philippe; Martinet, Jean-Marie; Maurin, Jean; and Rossarie, Jean, 4,411,790., Cl. 210-637.000.

BASF Aktiengesellschaft: *See*—
Brandstetter, Franz; Echte, Adolf; Gausepohl, Hermann; and Naarmann, Herbert, 4,412,037., Cl. 525-68.000.
Degner, Dieter; Roos, Hans; and Hannebaum, Heinz, 4,411,746., Cl. 204-59.00R.
Koenig, Karl-Heinz; and Feuerherd, Karl-Heinz, 4,411,752., Cl. 204-158.0HA.
Naarmann, Herbert; Penzien, Klaus; Schlag, Johannes; and Simak, Petr, 4,411,826., Cl. 252-518.000.
Reuter, Peter; Blechschmitt, Kurt; and Wirth, Friedrich, 4,411,818., Cl. 502-35.000.
Rohr, Wolfgang; Hansen, Hanspeter; Wuerzer, Bruno; and Ceser, Heinz-Guenter, 4,411,691., Cl. 71-92.000.
Roos, Hans; Boehn, Hugo; Bittler, Knut; Kiener, Volker; and Wunsch, Gerd, 4,411,761., Cl. 204-290.00R.
Sander, Bruno; Hess, Klaus; Lintz, Peter; and Goesele, Walter, 4,411,797., Cl. 210-727.000.
Zeeh, Bernd; Goetz, Norbert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, 4,411,687., Cl. 71-76.000.

BASF Wyandotte Corporation: *See*—
Dutton, Daniel R.; Parker, Edward J.; Ott, Roger A.; and Otten, Jay G., 4,411,810., Cl. 252-99.000.
Panek, Edward J.; and Davis, Pauls, 4,411,819., Cl. 252-315.100.

Basterfield, Ernest P.; and Basterfield, Parker L., to Chern Developments Limited. Pressure vessel construction. 4,411,372., Cl. 220-327.000.

Basterfield, Parker L.: *See*—
Basterfield, Ernest P.; and Basterfield, Parker L., 4,411,372., Cl. 220-327.000.

Batistoni, Michel, to Frammatome. Numerical control surfacing plate. 4,411,177., Cl. 82-2.00E.

Bator, Patricia E.: *See*—
Klein, Kenneth; Bator, Patricia E.; and Pact, Harry H., 4,412,027., Cl. 524-364.000.

Baudouin, Michel; and Desbois, Michel, to Rhone-Poulenc Sante. Process for the preparation of quinolin-4-ones. 4,412,075., Cl. 546-153.000.

Baudouin, Michel; and Michelet, Daniel, to Rhone-Poulenc Sante. Preparation of 4-hydroxyquinolines. 4,412,076., Cl. 546-153.000.

Bauer, James J., to Clark Equipment Company. Operator protective posts. 4,411,464., Cl. 296-102.000.

Baumgartner, Alfred. Bat for playing games. 4,411,427., Cl. 273-67.00R.

Baxter Travenol Laboratories, Inc.: *See*— .
Boarini, Edward J.; and Jonker, Joseph W., 4,411,654., Cl. 604-165.000.
Kamen, Dean L., 4,411,649., Cl. 604-65.000.
Norton, William W., 4,411,047., Cl. 17-51.000.
Olson, Wayne P., 4,411,795., Cl. 210-679.000.
Pearson, Stephen, 4,411,662., Cl. 604-411.000.

Bayer Aktiengesellschaft: *See*—
Alberts, Heinrich; Friemann, Hans; Moretto, Hans-Heinrich; Sattlegger, Hans; and Mietzsch, Fritz, 4,412,039., Cl. 525-106.000.
Geisler, Klaus, 4,411,841., Cl. 260-543.00F.
Harnisch, Horst, 4,411,946., Cl. 428-219.000.
Heitz, Walter; Kress, Hans-Jurgen; and Stix, Wolfgang, 4,412,063., Cl. 528-409.000.
Nickel, Andreas; Reissinger, Karl H.; Brandt, Hans-Walther; and Melin, Thomas, 4,411,942., Cl. 428-137.000.
von Bonin, Wulf; von Gizycki, Ulrich; Wagner, Kuno; and Schapel, Dietmar, 4,411,262., Cl. 128-90.000.
Wild, Peter; and Nickel, Horst, 4,411,669., Cl. 8-654.000.

BBC Brown, Boveri & Company Limited: *See*—
Albrecht, Joachim; Duerig, Thomas; and Schroeder, Gunther, 4,411,711., Cl. 148-11.50A.

Beal, Glenn I., to R. M. Smith, Inc. Hose coupling and clamp. 4,411,460., Cl. 285-243.000.

Beard, William Q., Jr.; and Wilson, Richard L., to Vulcan Materials Company. Process for separating ferric iron from chlorinated hydrocarbons. 4,412,086., Cl. 570-262.000.

Becker Dental-Labor GmbH: *See*—
Becker, Gunter; and Weiden, Horst, 4,411,626., Cl. 433-223.000.

Becker, Gunter; and Weiden, Horst, to Becker Dental-Labor GmbH. Process and apparatus for preparing a crown portion to be fixed on a tooth. 4,411,626., Cl. 433-223.000.

Becker, Josef, to Hewlett-Packard GmbH. Pulse generator circuit. 4,412,138., Cl. 307-264.000.

Becker, Wolfgang, to Blessing, Wilhelm. Swinging chuck for turning machines. 4,411,440., Cl. 279-5.000.

Beckman Instruments, Inc.: *See*—
Franklin, Robert C., 4,412,279., Cl. 363-128.000.
Harman, John N., III; and Jones, Robert H., 4,411,764., Cl. 204-411.000.
Momany, Frank A., 4,411,890., Cl. 424-177.000.

Becton, Dickinson and Company: *See*—
Noack, W. L., 4,411,868., Cl. 422-104.000.

Bedford Industries, Inc.: *See*—
Tinklenberg, Lloyd, 4,411,644., Cl. 493-213.000.

Bednar, Thomas R., to Falk Corporation, The. Pneumatic clutch. 4,411,347., Cl. 192-88.00B.

Beeson, Kenneth E.: *See—*
Lautzenheiser, William J.; Simonetti, Richard A.; Henderson, Martin E.; Edson, James B.; and Beeson, Kenneth E., 4,412,211., Cl. 340-514.000.

Beetle, Robert H., to Abex Corporation. Metal founding. 4,411,305., Cl. 164-529.000.

Behrendt, Martin, to Wickmann-Werke AG. Fuse holder for a cartridge fuse. 4,411,486., Cl. 339-147.00R.

Behringwerke Aktiengesellschaft: *See—*
Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Drescher, Heinz H., 4,411,794., Cl. 210-670.000.
Toth, Tibor; and Gils, Reiner, 4,411,988., Cl. 435-7.000.

Belani, Jagdish G., to National Semiconductor Corporation. Polymeric insulation layer etching process and composition. 4,411,735., Cl. 156-659.100.

Bell & Howell Company: *See—*
Karsh, Herbert; and Karsh, Irving, 4,411,397., Cl. 242-192.000.
Kosner, Jerry J., 4,411,416., Cl. 271-11.000.

Bell Telephone Laboratories, Incorporated: *See—*
Ackland, Bryan D.; and Weste, Neil H. E., 4,412,313., Cl. 365-221.000.
Ammann, Hans H.; Bonanni, Rocco; and Engelmaier, Werner, 4,412,123., Cl. 219-233.000.
Beni, Gerardo; Craighead, Harold G.; and Hackwood, Susan, 4,411,495., Cl. 350-347.00V.
Briley, Bruce E.; and Montsma, John, 4,412,322., Cl. 370-58.000.
Ekholm, David T., 4,412,307., Cl. 365-8.000.
Embree, Milton L., 4,412,184., Cl. 330-69.000.
Gersho, Allen; Ho, Edmond Y.; Gitlin, Richard D.; Lawrence, Victor B.; and Lim, Tong L., 4,412,341., Cl. 375-102.000.
Limb, John O., 4,412,326., Cl. 370-85.000.
Macklin, John J.; Silfvast, William T.; and Wood, Obert R., II, 4,411,733., Cl. 156-643.000.
Miedema, Hotze, 4,412,350., Cl. 455-306.000.
Miller, Anton J., 4,411,731., Cl. 156-630.000.

Bendix Corporation, The: *See—*
Hammelmann, Robert W., 4,411,634., Cl. 464-91.000.
Rauch, Burton S., 4,411,637., Cl. 464-180.000.

Beni, Gerardo; Craighead, Harold G.; and Hackwood, Susan, to Bell Telephone Laboratories, Incorporated. Refractive index switchable display cell. 4,411,495., Cl. 350-347.00V.

Bennett, Douglas L.; and Amoss, Donald C., to Air Products and Chemicals, Inc. Boiling coolant ozone generator. 4,411,756., Cl. 204-176.000.

Bennett, Robert A.; and Nuckols, Walter S. Liquid soap dispenser. 4,411,376., Cl. 222-212.000.

Bennwik, Percy; and Hjertman, Birger, to Vitrum AB. Package. 4,411,358., Cl. 206-45.340.

Berge, Charles T.; and Mack, Mark P., to Conoco Inc. Poly(oxy(silylene) esters). 4,412,065., Cl. 528-26.000.

Berger, Abe, to M & T Chemicals Inc. Hydantoinylsilanes. 4,412,078., Cl. 548-110.000.

Berger, Horst H.; and Wiedmann, Siegfried K., to International Business Machines Corporation. Multiaddressable highly integrated semiconductor storage. 4,412,312., Cl. 365-189.000.

Bergeron, David L., to International Business Machines Corporation. Programmable bipolar structures. 4,412,308., Cl. 365-105.000.

Bergez, Pierre: *See—*
Arod, Jean; Bartoli, Bernard; Bergez, Pierre; Biedermann, Jean; Caminade, Philippe; Martinet, Jean-Marie; Maurin, Jean; and Rossarie, Jean, 4,411,790., Cl. 210-637.000.

Bergman, Gunnar B., to SeaTek. Apparatus for reducing roll and pitch motions of floating vessels. 4,411,212., Cl. 114-125.000.

Bergmann, Horst: *See—*
Hardenberg, Horst; and Bergmann, Horst, 4,411,243., Cl. 123-577.000.

Berkman, Joseph L. Holder for audio/video cassettes, games cartridges and storage cases. 4,411,481., Cl. 312-8.000.

Berlin & Jones Company, Inc.: *See—*
Higginson, Richard L., 4,411,643., Cl. 493-188.000.

Bermudez, Mauricio; Klimpel, Richard R.; and Sands, Steven D., to Dow Chemical Company, The. Method for grinding cereal grains in the presence of grinding aids. 4,411,927., Cl. 426-618.000.

Bernareggi, Virgilio; Margutti, Roberto; Bonifacio, Fausto; and Fano, Maurizio, to Valeas S.p.A. Salts of endo-8-methyl-8-syn-alkyl-8-azoniabicyclo-[3.2.1]-octane-3-alkylcarboxylates, and therapeutic compositions containing them. 4,411,902., Cl. 424-265.000.

Bernelin, Daniel: *See—*
Meyer, Jacques; and Bernelin, Daniel, 4,412,034., Cl. 524-791.000.

Bernhardt, Martin: *See—*
Schutt, Peter; Bernhardt, Martin; Nitsche, Klaus; Grindler, Horst; and Hofmann, Hans-Joachim, 4,411,550., Cl. 403-358.000.

Berthold, Richard: *See—*
Payne, Trevor G.; and Berthold, Richard, 4,411,913., Cl. 424-330.000.

Best, Gerd; and Weikert, Norbert B., to Krampe & Co. Fertifung in Bergbaubedarf GmbH. Cutting drum. 4,411,475., Cl. 299-81.000.

Bethge, Horst; Kleemann, Axel; and Martens, Jurgen, to Degussa Aktiengesellschaft. Process for the resolution of the racemate S-(carboxymethyl)-(RS)-cysteine (B). 4,411,840., Cl. 260-501.120.

Betti, Vittorio: *See—*
Cimino, Andrea; Plicchi, Gianni; Mangiarotti, Luigi; Rossi, Maurizio; Betti, Vittorio; Spighi, Massimo; and Zingaretti, Gabriele, 4,411,918., Cl. 426-124.000.

Betts, William H., to Wean United, Inc. Shell for a composite roll. 4,411,713., Cl. 148-35.000.

Betz Laboratories, Inc.: *See—*
Geiger, Gary E.; and May, Roger C., 4,411,865., Cl. 422-16.000.

Bevacqua, Saverio F.: *See—*
Ragonese, Louis J.; Schmitz, Nicholas A.; Bevacqua, Saverio F.; and Owyang, King, 4,412,142., Cl. 307-477.000.

Beyer, Horst: *See—*
Hostettler, Hans U.; and Beyer, Horst, 4,411,886., Cl. 424-70.000.

Bickley, Robert H.; Broughton, Christopher D.; and Genrich, Thad J., to Motorola Inc. Power amplifier and envelope correction circuitry. 4,412,337., Cl. 375-60.000.

Biedermann, Jean: *See—*
Arod, Jean; Bartoli, Bernard; Bergez, Pierre; Biedermann, Jean; Caminade, Philippe; Martinet, Jean-Marie; Maurin, Jean; and Rossarie, Jean, 4,411,790., Cl. 210-637.000.

Bienwald, Wolfgang F.; and Tumsuden, Herbert W., Jr., to Leviton Manufacturing Company, Inc. Resettable circuit breaker for use in ground fault circuit interrupters and the like. 4,412,193., Cl. 335-18.000.

Biggers, James V.: *See—*
Klicker, Kenneth A.; Newnham, Robert E.; Cross, Leslie E.; and Biggers, James V., 4,412,148., Cl. 310-358.000.

Billault, Georges: *See—*
Runavot, Yves; Billault, Georges; and Salvetat, Jaques, 4,412,030., Cl. 524-505.000.

Bindel, Paul. Tire traction chain. 4,411,301., Cl. 152-213.00R.

Biochemical Research Corporation: *See—*
Welebir, Andrew J., 4,411,685., Cl. 71-84.000.

Birdsall, John D.; Liedtke, Ronald; and Smollar, Marvin, to Birdsall, John D. Toy vehicle. 4,411,098., Cl. 46-206.000.

Birk, John R.: *See—*
Kelley, Robert B.; Birk, John R.; Martins, Henrique; and Tella, Richard P., 4,412,293., Cl. 364-513.000.

Bittler, Knut: *See—*
Roos, Hans; Boehn, Hugo; Bittler, Knut; Kiener, Volker; and Wunsch, Gerd, 4,411,761., Cl. 204-290.00R.

Black, Charles E., III: *See—*
Schaad, William J.; Black, Charles E., III; and Halstead, Raymond T., 4,412,109., Cl. 200-16.00C.

Black Clawson, Inc.: *See—*
Halgrimson, Darrell N.; Hanson, Donald H.; and King, Richard T., 4,412,297., Cl. 364-559.000.
Halgrimson, Darrell N.; Hanson, Donald H.; and King, Richard T., 4,412,297., Cl. 364-559.000.

Black & Decker Inc.: *See—*
Jefferson, Keith A.; and Lansdell, Derek A., 4,412,158., Cl. 318-257.000.
Mixer, John E., 4,411,173., Cl. 74-785.000.
Sell, Michael R., 4,412,168., Cl. 320-48.000.

Blacklin, Peter A.; Dougherty, James R.; Johnson, Richard J.; and Tate, Donald L., to Tate Architectural Products, Inc. Structural member with truncated conical portion and composite panel including same. 4,411,121., Cl. 52-792.000.

Blaudszun, Bernd, to Lohmann GmbH & Co. KG. Process and apparatus for drying of solvent containing material. 4,411,075., Cl. 34-32.000.

Blazey, Richard N.: *See—*
Gilmour, Hugh S. A.; and Blazey, Richard N., 4,411,973., Cl. 430-7.000.

Blechschmitt, Kurt: *See—*
Reuter, Peter; Blechschmitt, Kurt; and Wirth, Friedrich, 4,411,818., Cl. 502-35.000.

Blessing, Wilhelm: *See—*
Becker, Wolfgang, 4,411,440., Cl. 279-5.000.

Blinow, Igor, to Polaroid Corporation. Strobe reflector assembly. 4,412,276., Cl. 362-278.000.

Block, Jacob: *See—*
Green, Peter C.; and Block, Jacob, 4,411,800., Cl. 252-8.50A.

Blokland, Adriaan, to J. de Reus B.V. Stair-climbing apparatus for a wheel chair or similar mobile transport means. 4,411,330., Cl. 180-8.00A.

Blomsterberg, Karl-Ingemar. Method of anodically deburring articles of steel or aluminium alloys in an electrolytic bath, and a bath for carrying out the method. 4,411,751., Cl. 204-129.850.

Bluege, John H., to United Technologies Corporation. Dispersionless refractor for use with high-power lasers. 4,411,492., Cl. 350-173.000.

Blume, Horst K.; and Asakura, Toshio, to Technical Consulting Services. Cuvette for blood oxygen analysis apparatus. 4,411,523., Cl. 356-246.000.

Board of Regents, The University of Texas System: *See—*
Davis, Charles P.; Warren, Michael M.; and Arnett, David W., 4,411,648., Cl. 604-21.000.

Boarini, Edward J.; and Jonker, Joseph W., to Baxter Travenol Laboratories, Inc. Peelable catheter with securing ring and suture sleeve. 4,411,654., Cl. 604-165.000.

Boehm, Alfred; and Richter, Eberhard, to LIBA Maschinenfabrik GmbH. Speed-compensating device for the feeding of threads to a weaving or knitting machine. 4,411,392., Cl. 242-35.50R.

Boehn, Hugo: *See—*
Roos, Hans; Boehn, Hugo; Bittler, Knut; Kiener, Volker; and Wunsch, Gerd, 4,411,761., Cl. 204-290.00R.

Boeing Company, The: *See—*
Amberg, Robert L.; and Gaseor, Thomas J., 4,412,291., Cl. 364-426.000.
Hapke, Donald W., 4,411,399., Cl. 244-130.000.
Perry, Clifford R.; Dietz, Lloyd H.; and Shannon, Roger L., 4,411,310., Cl. 165-166.000.

Shrader, John E.; and Zimmerschied, Alan B., 4,411,198., Cl. 102-216.000.
Stapleton, Brian P., 4,412,221., Cl. 343-705.000.

Boelke, Art: *See*—
Rushing, Wilford A.; and Rushing, Barbara R., 4,411,095., Cl. 46-7.000.

Boelke, Rosemary E.: *See*—
Rushing, Wilford A.; and Rushing, Barbara R., 4,411,095., Cl. 46-7.000.

Bohg, Armin; and Hartmann, Kurt, to International Business Machines Corporation. Electromagnetic ram actuator. 4,412,197., Cl. 335-256.000.

Bohm, Gunter; and Funk, Wolfram, to Thyssen Industrie Ag Maschinenbau. Method for welding bodies made of very hard or greatly refined armored steel, respectively, and structures made according to this method. 4,412,122., Cl. 219-137.00R.

Bois, Daniel. Integrated opto-electronic relay using a semiconductor with persistent photoconductivity and a matrix of such relays. 4,412,235., Cl. 357-19.000.

Boise Cascade Corporation: *See*—
Woerz, Stephen E.; and Canup, Travis K., 4,411,726., Cl. 156-423.000.

Bolha, David J. Building siding replacement device and method. 4,411,117., Cl. 52-521.000.

Bolles, Robert C.: *See*—
Kremers, Jan H.; and Bolles, Robert C., 4,412,121., Cl. 219-124.340.

Bollinger, Frederic G., to Monsanto Company. Substituted 2-imino-1,3-dithio and 1,3-oxathio heterocyclic compounds as herbicidal antidotes. 4,411,688., Cl. 71-90.000.

Bollinger, Frederic G., to Monsanto Company. Substituted 2-imino-1,3-dithio and 1,3-oxathio heterocyclic compounds as herbicidal antidotes. 4,411,689., Cl. 71-90.000.

Bonanni, Rocco: *See*—
Ammann, Hans H.; Bonanni, Rocco; and Engelmaier, Werner, 4,412,123., Cl. 219-233.000.

Bonifacio, Fausto: *See*—
Bernareggi, Virgilio; Margutti, Roberto; Bonifacio, Fausto; and Fano, Maurizio, 4,411,902., Cl. 424-265.000.

Booth, Weldon S. Method of making a high-capacity earthbound structural reference. 4,411,557., Cl. 405-238.000.

Boothroyd, Howard W.; and Carlsmith, Lawrence A., to Ingersoll-Rand Company. Shear overload release coupling. 4,411,635., Cl. 464-33.000.

Borg-Warner Chemicals, Inc.: *See*—
Hechenbleikner, Ingenuin; and Enlow, William P., 4,411,842., Cl. 260-543.00P.

Borows, Allan A. One way stopper plug for bottles. 4,411,369., Cl. 215-21.000.

Borzym, John J. Belt driven flying cutoff apparatus. 4,411,182., Cl. 83-319.000.

Bos, Peter J., to AMF Incorporated. Defrost control system and display panel. 4,411,139., Cl. 62-126.000.

Bosch-Siemens Hausgerate GmbH: *See*—
Scholl, Michael; and Klassen, Herbert, 4,411,143., Cl. 68-12.00R.

Bosshard, Hans: *See*—
Schroder, Joris; Bosshard, Hans; Kiml, Jiri; Kostka, Miroslav; and Zimmermann, Walter, 4,411,337., Cl. 187-29.00R.

Bothwell, P. W. Motor cycle fairing. 4,411,333., Cl. 180-219.000.

Bouley, Robert W.; and Kovar, Robert F., to Albany International Corp. Curing polyepoxide resin binders in syntactic foam forming compositions. 4,412,012., Cl. 521-54.000.

Bouvet, Claude: *See*—
Terrien, Michel E.; and Bouvet, Claude, 4,411,037., Cl. 14-2.600.

Bowen, Robert F.: *See*—
Dudley, Kenneth W.; Teich, Wesley W.; and Bowen, Robert F., 4,412,117., Cl. 219-10.55F.

Bowman, Kenneth A.: *See*—
Dawless, Robert K.; Bowman, Kenneth A.; Mazgaj, Robert M.; and Cochran, C. Norman, 4,411,747., Cl. 204-67.000.

Boyles, David A.; Gaines, Jack R.; and Haissig, Bruce E., to United States of America, Agriculture. Auxin compositions of N-phenyl and N-chloro phenyl indolyl-3-alkylene amides and their use as auxin growth regulators. 4,411,684., Cl. 71-77.000.

Boyum, George A.; Renner, Robert A.; and Lovelace, Ralph, to Jarraff Industries, Inc. Tree-trimming apparatus. 4,411,070., Cl. 30-379.500.

Braddock, Walter D., III. Automated stock exchange. 4,412,287., Cl. 364-408.000.

Bradley, Walter E.: *See*—
Floyd, Terry S.; Rhoden, Donna G.; and Bradley, Walter E., 4,411,280., Cl. 131-332.000.

Braga, Renato. Silver-plated tooth brush. 4,411,041., Cl. 15-167.00R.

Braginski, Aleksander I.; and Male, Alan T., to Westinghouse Electric Corp. Submicron-particle ductile superconductor. 4,411,959., Cl. 428-558.000.

Bramson, Mogens L. Water unit for use with a membrane blood oxygenator. 4,411,872., Cl. 422-310.000.

Brandenstein, Manfred: *See*—
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Ernst, Horst M., 4,411,478., Cl. 308-6.00C.

Brandstetter, Franz; Echte, Adolf; Gausepohl, Hermann; and Naarmann, Herbert, to BASF Aktiengesellschaft. Thermoplastic molding materials. 4,412,037., Cl. 525-68.000.

Brandt, Hans-Walther: *See*—
Nickel, Andreas; Reissinger, Karl H.; Brandt, Hans-Walther; and Melin, Thomas, 4,411,942., Cl. 428-137.000.

Branson Ultrasonics Corporation: *See*—
Sager, Thomas B., 4,411,720., Cl. 156-69.000.

Brauner, Jochen: *See*—
Kremer, Karl J.; Brauner, Jochen; Glaubitz, Klaus-Dieter; Eckstein, Helmut; and Bruggemann, Josef, 4,411,524., Cl. 356-313.000.

Brede, Uwe; Penner, Horst; Stahlmann, Rudolf; and Zeiher, Erich, to Dynamit Nobel Aktiengesellschaft. Short trajectory round. 4,411,200., Cl. 102-529.000.

Breglia, Denis R.; Oharek, Frank J.; and Grimmer, Paul D., to United States of America, Navy. Articulated light guide. 4,411,627., Cl. 434-44.000.

Bregolin, Graziano: *See*—
Maillard, Laurent; and Bregolin, Graziano, 4,411,116., Cl. 52-489.000.

Brennan, Thomas M.; and Hendrick, Michael E., to Pfizer Inc. Branched amides of L-aspartyl-d-amino acid dipeptides. 4,411,925., Cl. 426-548.000.

Brennecke, Paul; and McAuliffe, Donald C., to Coors Container Company. Processes for making can end stock from roll cast aluminum and product. 4,411,707., Cl. 148-2.000.

Briand, Louis: *See*—
Ecomard, Andre; and Briand, Louis, 4,411,238., Cl. 123-501.000.

Bridgestone Tire Company Limited: *See*—
Ito, Taizo; and Araki, Yusuke, 4,411,724., Cl. 156-304.100.
Takahashi, Kenichi; Hirano, Koichi; and Futamura, Shoji, 4,411,173., Cl. 76-107.00R.

Briggs, John N., to Marconi Company Limited, The. Secondary radar responders. 4,412,219., Cl. 343-6.80R.

Briley, Bruce E.; and Montsma, John, to Bell Telephone Laboratories, Incorporated. Time division switching system. 4,412,322., Cl. 370-58.000.

Brill, Joseph H. Process and apparatus for producing compost. 4,411,682., Cl. 71-9.000.

Brisken, Thomas A.; and Maier, Alexander G., to United States of America, Air Force. Method of enhancing rotor bore cyclic life. 4,411,715., Cl. 148-131.000.

British Gas Corporation: *See*—
Timmins, Cyril; and Templeman, John J., 4,411,039., Cl. 15-104.06R.

British Petroleum Company, p.l.c., The: *See*—
Ward, Denis S., 4,411,791., Cl. 210-649.000.

British Steel Corporation: *See*—
Meredith, Douglas; and Cronin, James A., 4,411,667., Cl. 8-471.000.
Spenceley, Gene D.; and Welbourn, Brian C., 4,411,697., Cl. 75-60.000.

Brock, James D.; and Morrison, Gerald B., to Tuftec, Inc. Yarn saving method and apparatus. 4,411,207., Cl. 112-79.00A.

Brockway Glass Co., Inc.: *See*—
McDole, Lawrence K., 4,411,353., Cl. 198-425.000.

Brockway, Richard J., to Sanders Associates, Inc. Infrared source. 4,412,126., Cl. 219-553.000.

Brodie, Benjamin T. AC Resistor attenuator and associated amplifier circuits. 4,412,183., Cl. 330-68.000.

Brogna, Christopher B., to Celanese Corporation. Process for disposing of carbon fibers. 4,411,880., Cl. 423-659.000.

Brois, Stanley J.: *See*—
Gutierrez, Antonio; Brois, Stanley J.; Ryer, Jack; and Deen, Harold E., 4,411,808., Cl. 252-78.100.

Bromley, James E.; and Dees, John R., to Fiber Industries, Inc. Spinning process with a desensitized spinneret design. 4,411,852., Cl. 264-171.000.

Broome, Stephanie A.: *See*—
Gilbert, Walter; Broome, Stephanie A.; Villa-Komaroff, Lydia J.; and Efstratiadis, Argiris A., 4,411,994., Cl. 435-71.000.

Brosius, Klaus; and Herrmann, Berthold, to Voith Getriebe KG. Hydrodynamic brakes. 4,411,340., Cl. 188-296.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Asano, Kiyomitsu; Kondo, Toshikatsu; and Mizuno, Shigeru, 4,411,538., Cl. 400-124.000.

Broughton, Christopher D.: *See*—
Bickley, Robert H.; Broughton, Christopher D.; and Genrich, Thad J., 4,412,337., Cl. 375-60.000.

Brown, Robert J. S., to Chevron Research Company. Computer-controlled, portable pulsed NMR instrument and method of use wherein a DC magnetic field gradient is artificially introduced. 4,412,178., Cl. 324-303.000.

Brown, Robert J. S., to Chevron Research Company. Computer-controlled, portable pulsed NMR instrument and method of use wherein the times of RF interrogation are distributed over at least a cycle at the nuclear magnetization precessional frequency. 4,412,179., Cl. 324-303.000.

Brown, Wallace G.; and Lee, Otha C., to Proctor & Associates Co. Call data monitoring for electromechanical telephone switching systems. 4,412,101., Cl. 179-7.10R.

Browne, John M., to Xerox Corporation. Bottom sheet feeding apparatus. 4,411,417., Cl. 271-94.000.

Bruckner, Neal R.: *See*—
Lanham, Joseph S.; and Bruckner, Neal R., 4,411,552., Cl. 403-388.000.

Bruggemann, Josef: *See*—
Kremer, Karl J.; Brauner, Jochen; Glaubitz, Klaus-Dieter; Eckstein, Helmut; and Bruggemann, Josef, 4,411,524., Cl. 356-313.000.

Brun, Robert P.: *See*—
Minvielle, Monique L. S.; Mazoin, Albert H. F.; Brun, Robert P.; Chevanne, Sylvain V. L.; and See, Jacques L. A., 4,411,555., Cl. 405-50.000.

Brussing, Bernd: *See*—
Zeischegg, Walter; and Brussing, Bernd, 4,411,318., Cl. 169-26.000.

Brustle, Klaus: *See*—
Rock, Erich; and Brustle, Klaus, 4,411,045., Cl. 16-243.000.

Bucheder, Erwin, to Koflach Sportgerate Gesellschaft. Device for closing a slot in an upper or gaiter of a skiing boot. 4,411,078., Cl. 36-117.000.

Budd Company, The: *See*—
Reidenbach, Robert B., 4,411,413., Cl. 269-48.100.

Buehrig, Gordon M.; and Buehrig, Kathryn L., to Kughn, Richard P. Automobile front end construction incorporating an air-bag. 4,411,462., Cl. 293-132.000.

Buehrig, Kathryn L.: *See*—
Buehrig, Gordon M.; and Buehrig, Kathryn L., 4,411,462., Cl. 293-132.000.

Bulten-Kanthal AB: *See*—
Schrewelius, Nils G., 4,411,936., Cl. 427-367.000.

Burdick, Patricia E.: *See*—
Albee, Paul J., Jr.; Burdick, Patricia E.; and Wrozina, Joseph I., 4,412,040., Cl. 525-143.000.

Burgdorf, Jochen, to ITT Industries, Inc. Two-circuit pressure control unit for hydraulic brake systems. 4,411,477., Cl. 303-22.00R.

Burkhardt, Charles W., to Petrolite Corporation. Use of polyamines as demulsifiers. 4,411,814., Cl. 252-344.000.

Burlington Industries, Inc.: *See*—
Baldwin, A. Frank, 4,411,928., Cl. 427-2.000.

Burroughs Corporation: *See*—
Barnes, George H.; Lundstrom, Stephen F.; and Shafer, Philip E., 4,412,303., Cl. 364-900.000.
Wallace, Harry L.; and Thomas, John D., 4,411,706., Cl. 134-37.000.

Bushman, Willard T.: *See*—
Sedam, Jason K.; Hale, James V. M.; Caldwell, Stewart W.; Bushman, Willard T.; and Wright, Richard A., 4,412,292., Cl. 364-479.000.

Bustos, Rafael T., to Leggett & Platt, Incorporated. Mobile display rack. 4,411,367., Cl. 211-187.000.

Butch, Peter J., III; and Puletti, Paul P., to National Starch and Chemical Corporation. Hot melt pressure sensitive adhesive and diaper tape closures coated therewith. 4,411,954., Cl. 428-343.000.

Buthe, Theo; and Mikeska, Felix, to Jean Walterscheid GmbH. Protective device for a universal joint assembly. 4,411,636., Cl. 464-172.000.

Butler, Richard A., to Mining & Chemical Products Limited. Injection moulding machine. 4,411,615., Cl. 425-591.000.

Butler, Robert S.; Claerbout, Paul F.; Kent, Louis P.; Cleland, Randy S.; Wilhelm, James H.; and Micko, Richard E., to Central Illinois Public Service Company. Dual alkali process for combustion gas cleaning. 4,411,875., Cl. 423-242.000.

Buuck, Frederick A., to Tokheim Corporation. Intrinsic barrier. 4,412,265., Cl. 361-18.000.

Caddell, Samuel N., to Systems Engineering and Manufacturing Corp. Safety device for use in conveyor-type apparatus. 4,411,357., Cl. 198-802.000.

Caldwell, Stewart W.: *See*—
Sedam, Jason K.; Hale, James V. M.; Caldwell, Stewart W.; Bushman, Willard T.; and Wright, Richard A., 4,412,292., Cl. 364-479.000.

Cambier, Graig S.; and Trubell, Lawrence P., to International Business Machines Corporation. Ac-to-dc converter using polarized input isolation capacitors. 4,412,278., Cl. 363-126.000.

Cameron Iron Works, Inc.: *See*—
Gieswein, Jimmie T., 4,411,317., Cl. 166-347.000.

Caminade, Philippe: *See*—
Arod, Jean; Bartoli, Bernard; Bergez, Pierre; Biedermann, Jean; Caminade, Philippe; Martinet, Jean-Marie; Maurin, Jean; and Rossarie, Jean, 4,411,790., Cl. 210-637.000.

Campbell, Willis R.: *See*—
Diederich, Anthony F., Jr.; Haldeman, Peter P.; and Campbell, Willis R., 4,411,127., Cl. 56-364.000.

Cancel, Radames. Singing electronic frog. 4,411,099., Cl. 46-232.000.

Canon Kabushiki Kaisha: *See*—
Adachi, Hiroyuki; and Taniishi, Shinnosuke, 4,411,516., Cl. 355-67.000.
Kazumi, Jiro, 4,411,508., Cl. 354-198.000.
Kinoshita, Takao; Hosoe, Kazuya; and Yamamichi, Masayoshi, 4,411,504., Cl. 354-25.000.
Komori, Shigehiro; and Ogawa, Hiroshi, 4,411,514., Cl. 355-14.0CH.
Nozaki, Mineo; Nagashima, Masasumi; and Asakura, Osamu, 4,411,540., Cl. 400-175.000.
Ohnuma, Takashi, 4,412,164., Cl. 318-596.000.
Sakai, Shinji; Shinoda, Nobuhiko; Hosoe, Kazuya; and Kinoshita, Takao, 4,411,505., Cl. 354-25.000.
Sugitani, Hiroshi, 4,412,224., Cl. 346-1.100.

Canova, Giuseppe: *See*—
Stella, Antonio; and Canova, Giuseppe, 4,412,269., Cl. 361-263.000.

Canup, Travis K.: *See*—
Woerz, Stephen E.; and Canup, Travis K., 4,411,726., Cl. 156-423.000.

Capuano, Terry D., to Russell Burdsall & Ward Corporation. Rolling dies and method of forming the same. 4,411,147., Cl. 72-220.000.

Cardinal Manufacturing Co.: *See*—
Weisbach, Albert P., 4,411,404., Cl. 249-3.000.

Caret, Guy: *See*—
Helle, Jacques; and Caret, Guy, 4,412,188., Cl. 331-176.000.

Carey, Robert J. Rain gutter. 4,411,110., Cl. 52-11.000.

Carl Zeiss-Stiftung: *See*—
Lang, Walter H.; Muchel, Franz; Schulz, Kurt; and Summerer, Gunther, 4,411,502., Cl. 351-206.000.

Carlsmith, Lawrence A.: *See*—
Boothroyd, Howard W.; and Carlsmith, Lawrence A., 4,411,635., Cl. 464-33.000.

Carlson, David H. J., to UOP Inc. Method for treating mercaptans contained in a sour petroleum distillate. 4,411,776., Cl. 208-206.000.

Carlson, Nancy W.: *See*—
Dixon, George D.; Carlson, Nancy W.; and Saunders, Howard E., 4,412,048., Cl. 525-524.000.

Carmen, Ralph H., to Technicare Corporation. Ultrasonic image storage device and method. 4,412,248., Cl. 358-112.000.

Carmen, Ralph H., to Technicare Corporation. Ultrasonic image storage device and method. 4,412,249., Cl. 358-112.000.

Carmody, Michael A., to Baker International Corporation. Subterranean well valve with lock open mechanism. 4,411,316., Cl. 166-323.000.

Carnahan, John T., to Emerson Electric Company. Spring feeding device. 4,411,561., Cl. 406-137.000.

Carrier Corporation: *See*—
Traver, Darwin G.; Anderson, Carl M.; and Abdelhamid, Amr N., 4,411,592., Cl. 415-119.000.

Case, William J.; and Wallis, Christopher N., to International Business Machines Corporation. Sampled servo position control system. 4,412,165., Cl. 318-636.000.

Casey, Daniel T., to AMP Incorporated. Terminations for flat cable. 4,411,484., Cl. 339-97.00C.

Casio Computer Co., Ltd.: *See*—
Yamakita, Tooru, 4,412,304., Cl. 364-900.000.

Caslavsky, Vera B.; Gron, Poul; and Fine, Howard, to Forsyth Dental Infirmary for Children. Self-gelling liquid composition for topical application in the oral cavity. 4,411,889., Cl. 424-151.000.

Cassimally, Khalil A. I.; and Frommelt, Horace, to Cassimally, Khalil Ahmid Ibrahim. Luggage trolley. 4,411,343., Cl. 190-18.00A.

Cassimally, Khalil Ahmid Ibrahim: *See*—
Cassimally, Khalil A. I.; and Frommelt, Horace, 4,411,343., Cl. 190-18.00A.

Cassinelli, Giuseppe; Grein, Arpad; Merli, Sergio; and Rivola, Giovanni, to Farmitalia Carlo Erba, S.p.A. Preparation of II-deoxy anthracycline antibiotics. 4,411,834., Cl. 260-365.000.

Casteel, Vincent H.: *See*—
Klaus, Jack C.; Schroeder, Larry D.; Casteel, Vincent H.; and Schwartz, Kenneth E., 4,412,356., Cl. 455-603.000.

Castelli S.p.A.: *See*—
Ponzellini, Giulio, 4,411,471., Cl. 297-417.000.

Casu, Benito; Torri, Giangiacomo; and Zoppetti, Giorgio, to Crinos Industria Farmabiologica, S.p.A. Polyaminic resin for the selective separation of heparin from other glucosaminoglycanes and method for the preparation thereof. 4,411,796., Cl. 210-692.000.

Caterpillar Tractor Co.: *See*—
Hart, Cullen P., 4,411,447., Cl. 280-714.000.
Stedman, Robert N., 4,411,329., Cl. 180-7.00R.

Cebalo, Tony; and Walde, Robert A., to Air Products and Chemicals, Inc. Thiadiazole compounds and methods of using said compounds in agriculture. 4,412,079., Cl. 548-141.000.

Celanese Corporation: *See*—
Brogna, Christopher B., 4,411,880., Cl. 423-659.000.
Floyd, Terry S.; Rhoden, Donna G.; and Bradley, Walter E., 4,411,280., Cl. 131-332.000.

Celmer, Walter D.; Cullen, Walter P.; Shibakawa, Riichiro; and Tone, Junsuke, to Pfizer Inc. Tylosin macrolide antibiotics from streptomyces. 4,411,892., Cl. 424-181.000.

Celotex Corporation, The: *See*—
Frentzel, Richard L.; and Moss, Ernest K., 4,412,014., Cl. 521-129.000.
Snider, Scott C.; and DeLeon, Alberto, 4,411,949., Cl. 428-304.400.

Central Illinois Public Service Company: *See*—
Butler, Robert S.; Claerbout, Paul F.; Kent, Louis P.; Cleland, Randy S.; Wilhelm, James H.; and Micko, Richard E., 4,411,875., Cl. 423-242.000.

Ceser, Heinz-Guenter: *See*—
Rohr, Wolfgang; Hansen, Hanspeter; Wuerzer, Bruno; and Ceser, Heinz-Guenter, 4,411,691., Cl. 71-92.000.

Chalmers, Alexander F.: *See*—
Wollam, Carl A.; Gailey, J. Lynn; and Chalmers, Alexander F., 4,411,218., Cl. 118-411.000.

Chambers, John L.: *See*—
Workman, S. Thomas; Chambers, John L.; Pugh, Myron A.; and Ward, Roger W., 4,412,345., Cl. 378-078.000.

Chan, Keng S., to Standard Oil Company. Process for separating D_2O from H_2O using surfactant systems. 4,411,798., Cl. 210-727.000.

Chang, Pei K., to Nutrisearch Company. Fabricated shellfish products containing whey protein concentrate composition and method of preparation. 4,411,917., Cl. 426-104.000.

Chang, Yun F., to Ford Motor Company. Expandable urethane sealant compositions. 4,412,013., Cl. 521-121.000.

Chantant, Michel: *See*—
Leclercq, Joseph; Le Pargneux, Jacques; Feutrel, Claude; Lestiboudois, Guy; and Chantant, Michel, 4,411,862., Cl. 376-442.000.

Chapleo, Christopher B.; and Myers, Peter L., to Reckitt & Colman Products Limited. Imidazoline derivatives as presynaptic α_2-adrenoreceptor antagonists. 4,411,908., Cl. 424-273.00R.

Chapman, Lynn C., to M/A-COM DCC, Inc. Feedback circuit for controlling the peak optical output power of an injection laser. 4,412,331., Cl. 372-29.000.

Charbonneau, Jacques: *See*—
Tailleux, Christian; and Charbonneau, Jacques, 4,411,195., Cl. 101-226.000.

Charlap, E. Paul: *See*—
Landa, Benzion; and Charlap, E. Paul, 4,411,976., Cl. 430-114.000.

Charrier, Michel: *See*—
Peltier, Michel; Gloanec, Maurice; Nuzillat, Gerard; Maurel, Vincent; and Charrier, Michel, 4,412,336., Cl. 375-4.000.

Chase, Brian D., to International Business Machines Corporation. Convergence unit for in-line color cathode ray tube. 4,412,194., Cl. 335-210.000.

Chemetals Incorporated: *See*—
Welsh, Jay Y., 4,411,878., Cl. 423-605.000.

Chemische Werke Huels AG: *See*—
Zerpner, Dieter; and Streck, Roland, 4,412,038., Cl. 525-101.000.

Chen, H. Chiu, to Chevron Research Company. Method of making a catalyst suitable for hydrometalation of hydrocarbonaceous feedstocks. 4,411,824., Cl. 502-323.000.

Chen, John Y., to Hughes Aircraft Company. Process for fabricating CMOS devices with self-aligned channel stops. 4,411,058., Cl. 29-571.000.

Chen, Nai Y.; Scott, Eric J.; and Shihabi, David S., to Mobil Oil Corporation. Hydrovisbreaking process. 4,411,770., Cl. 208-111.000.

Chen, Richard M.: *See*—
Spackova, Daniela; and Chen, Richard M., 4,411,094., Cl. 43-121.000.

Chenet, Jacques; and Pierlot, Michel, to Societe Industrielle de Brevets et d'Etudes S.I.B.E. Carburation devices for internal combustion engines. 4,411,233., Cl. 123-439.000.

Chern Developments Limited: *See*—
Basterfield, Ernest P.; and Basterfield, Parker L., 4,411,372., Cl. 220-327.000.

Chevanne, Sylvain V. L.: *See*—
Minvielle, Monique L. S.; Mazoin, Albert H. F.; Brun, Robert P.; Chevanne, Sylvain V. L.; and See, Jacques L. A., 4,411,555., Cl. 405-50.000.

Chevron Research Company: *See*—
Brown, Robert J. S., 4,412,178., Cl. 324-303.000.
Brown, Robert J. S., 4,412,179., Cl. 324-303.000.
Chen, H. Chiu, 4,411,824., Cl. 502-323.000.
Heath, Warren A., 4,411,290., Cl. 137-615.000.

Chicklis, Evan P.: *See*—
Knights, Mark G.; and Chicklis, Evan P., 4,412,332., Cl. 372-70.000.

Chilman, John A., to Sundstrand Corporation. Ram air turbine control system. 4,411,596., Cl. 416-51.000.

Chivas Products Limited: *See*—
Moore, Ronald D., 4,411,944., Cl. 428-172.000.

Chloe Chimie: *See*—
Meyer, Jacques; and Bernelin, Daniel, 4,412,034., Cl. 524-791.000.

Cho, Kon H., to Western Electric Co., Inc. Method of manufacturing dielectrically-isolated single-crystal semiconductor substrates. 4,411,060., Cl. 29-576.00W.

Chown, Martin; and Farrington, Jeffrey G., to International Standard Electric Corporation. Measurement of rotation rate using sagnac effect. 4,411,526., Cl. 356-350.000.

Christian, Donald K. Novel shelf arrangement for a drop shelf vending machine. 4,411,375., Cl. 221-90.000.

Christopherson, John K. Hand held, single shot, firearm. 4,411,086., Cl. 42-1.00R.

Ciba-Geigy Corporation: *See*—
Agarwal, Suresh C.; Jager, Horst; Podder, Nitya G.; and Mollet, Hans, 4,411,668., Cl. 8-527.000.
Hoegerle, Karl; and Ohnemus, Kurt, 4,412,074., Cl. 544-298.000.
Karrer, Friedrich, 4,412,021., Cl. 524-102.000.
Monnier, Charles E.; and Lohse, Friedrich, 4,412,047., Cl. 525-507.000.
Petitpierre, Jean C., 4,411,450., Cl. 282-27.500.
Scartazzini, Riccardo, 4,411,897., Cl. 424-246.000.
Schupp, Thomas; Traxler, Peter; and Nuesch, Jakob, 4,411,896., Cl. 424-244.000.

Cie Electro Mecanique: *See*—
Sterlini, Jacques, 4,411,739., Cl. 203-24.000.

Cieplik, Ronald J.: *See*—
Nelson, Alfred M.; Rasekhi, Houshang; and Cieplik, Ronald J., 4,412,263., Cl. 360-128.000.

Ciferri, Alberto: *See*—
Krigbaum, William R.; Ciferri, Alberto; and Preston, Jack, 4,412,059., Cl. 528-192.000.

Cimino, Andrea; Plicchi, Gianni; Mangiarotti, Luigi; Rossi, Maurizio; Betti, Vittorio; Spighi, Massimo; and Zingaretti, Gabriele, to Kontek - Tecnologie della Conservazione - S.R.L. Apparatus for preserving food by generating preservative gas. 4,411,918., Cl. 426-124.000.

Cincinnati Milacron Industries, Inc.: *See*—
Grone, Robert J.; and Schnell, Leonard R., 4,411,579., Cl. 414-417.000.

Cities Service Company: *See*—
Gulbrandsen, Arthur F.; and Oko, Uriel M., 4,411,871., Cl. 422-232.000.

Claerbout, Paul F.: *See*—
Butler, Robert S.; Claerbout, Paul F.; Kent, Louis P.; Cleland, Randy S.; Wilhelm, James H.; and Micko, Richard E., 4,411,875., Cl. 423-242.000.

Clapper, Allen R.; and Davis, Burlin, to Emerson Electric Co. Method of making a thermal switch having a lead interlocked thereto by a skived part of the lead. 4,411,061., Cl. 29-622.000.

Clark Equipment Company: *See*—
Bauer, James J., 4,411,464., Cl. 296-102.000.

Claudius Peters AG: *See*—
Zimmermann, Wilhelm, 4,411,113., Cl. 52-303.000.

Claver, Jorge C. Panel set for the formation of athermanous walls. 4,411,118., Cl. 52-582.000.

Cleland, Randy S.: *See*—
Butler, Robert S.; Claerbout, Paul F.; Kent, Louis P.; Cleland, Randy S.; Wilhelm, James H.; and Micko, Richard E., 4,411,875., Cl. 423-242.000.

Clelford, Douglas H.: *See*—
Murphy, Richard D.; and Clelford, Douglas H., 4,412,280., Cl. 364-200.000.

Clements, John D.: *See*—
Klipstein, Frederick A.; Engert, Richard E.; and Clements, John D., 4,411,888., Cl. 424-92.000.

Close, Albert R.; and Oster, Winton, to McCulloch Corporation. Spoolless string trimmer head. 4,411,069., Cl. 30-276.000.

Coates, David: *See*—
Crossland, William A.; and Coates, David, 4,411,494., Cl. 350-339.00R.

Coca-Cola Company, The: *See*—
Sedam, Jason K.; Hale, James V. M.; Caldwell, Stewart W.; Bushman, Willard T.; and Wright, Richard A., 4,412,292., Cl. 364-479.000.

Cochran, C. Norman: *See*—
Dawless, Robert K.; Bowman, Kenneth A.; Mazgaj, Robert M.; and Cochran, C. Norman, 4,411,747., Cl. 204-67.000.

Cohen, Ellen R.: *See*—
Schlanger, Samuel L., 4,411,334., Cl. 180-274.000.

Cohen, Sheppard: *See*—
Barakitis, Nikolaos; and Cohen, Sheppard, 4,412,152., Cl. 315-73.000.

Cole, Herbert S.: *See*—
Aftergut, Siegfried; and Cole, Herbert S., 4,411,812., Cl. 252-299.100.

Colgate-Palmolive Company: *See*—
Kenkare, Divaker B.; and Shumway, Durland K., 4,411,883., Cl. 424-47.000.
Wixon, Harold E., 4,411,803., Cl. 252-8.750.
Wixon, Harold E., 4,411,809., Cl. 252-91.000.

Collier, Lyn D.; and Stark, Marvin. Hatch cover locking mechanism. 4,411,371., Cl. 220-314.000.

Collins, Forrest L., to Henkel Corporation. Aldehydic compositions. 4,412,026., Cl. 524-354.000.

Combeau, Guy, to Societe d'Exploitation des Machines Dubuit. Centrally mechanically controlled printing machine. 4,411,191., Cl. 101-38.00A.

Combustion Engineering, Inc.: *See*—
Hamilton, Thomas B., 4,411,204., Cl. 110-347.000.

Commissariat a l'Energie Atomique: *See*—
Arod, Jean; Bartoli, Bernard; Bergez, Pierre; Biedermann, Jean; Caminade, Philippe; Martinet, Jean-Marie; Maurin, Jean; and Rossarie, Jean, 4,411,790., Cl. 210-637.000.
Leclercq, Joseph; Le Pargneux, Jacques; Feutrel, Claude; Lestiboudois, Guy; and Chantant, Michel, 4,411,862., Cl. 376-442.000.

Communications Systems, Inc.: *See*—
Wiseheart, Ronald W.; and Meyer, Daniel, 4,411,485., Cl. 339-125.00R.

Compagnie de Signaux et d'Entreprises Electriques: *See*—
Klein, Denys C., 4,412,154., Cl. 315-224.000.

Compagnie d'Electronique et de Piezo-Electricite C.E.P.E.: *See*—
Helle, Jacques; and Caret, Guy, 4,412,188., Cl. 331-176.000.

Compagnie Francaise de Raffinage: *See*—
Arod, Jean; Bartoli, Bernard; Bergez, Pierre; Biedermann, Jean; Caminade, Philippe; Martinet, Jean-Marie; Maurin, Jean; and Rossarie, Jean, 4,411,790., Cl. 210-637.000.

Compagnie Internationale de Participation et d'Investissement Cipari S.A.: *See*—
Devreux, Andre F. O.; and Jerumanis, Janis, 4,411,914., Cl. 426-12.000.

Compagnie Internationale pour l'Informatique Cii Honeywell Bull: *See*—
Delorme, Raymond L., 4,411,149., Cl. 72-385.000.
Lesieur, Jean-Paul, 4,412,257., Cl. 360-45.000.

Concord Laboratories, Inc.: *See*—
Raitto, Russell G., 4,411,275., Cl. 128-763.000.

Conlon, Thomas W.; and Edeleanu, Constantin, to United Kingdom Atomic Energy Authority. Monitoring of corrosion. 4,412,174., Cl. 324-65.0CR.

Conoco Inc.: *See*—
Berge, Charles T.; and Mack, Mark P., 4,412,065., Cl. 528-26.000.

Conrad, Ulrich: *See*—
Ableitner, Erich; Conrad, Ulrich; Derndinger, Hans-Otto; and Niemeier, Gerd, 4,411,237., Cl. 123-501.000.

Conti, Roger C., to Reliance Electric Company. Seal with face-to-face flat metal sealing washers. 4,411,437., Cl. 277-53.000.

Continental Gummi-Werke Aktiengesellschaft: *See*—
Heynhold, Ingo, 4,411,947., Cl. 428-250.000.
Control Data Corporation: *See*—
Newcomb, James S.; and Eumurian, Charles, 4,411,528., Cl. 356-375.000.
Cook, Gayle. Infant eye shield. 4,411,263., Cl. 128-132.00R.
Coors Container Company: *See*—
Brennecke, Paul; and McAuliffe, Donald C., 4,411,707., Cl. 148-2.000.
Corda, Giuseppe: *See*—
Miccoli, Franco; and Corda, Giuseppe, 4,412,311., Cl. 365-185.000.
Cordella, Johannes, to Voest-Alpine Aktiengesellschaft. Driving roller stand for continuous casting plants. 4,411,304., Cl. 164-448.000.
Cordis Dow Corp.: *See*—
Kell, Michael J., 4,411,603., Cl. 417-479.000.
Cornaby, David T., to Iomega Corporation. Digital control of servo circuit. 4,412,161., Cl. 318-561.000.
Corneille, David M. Coprecipitation process for thermionic cathode type materials. 4,411,827., Cl. 252-521.000.
Cornellier, Joseph R. Method and apparatus for inserting weft filaments. 4,411,294., Cl. 139-435.000.
Cornett, Walter G., III, to Urologic & Enteric Research Associates. Compressible syringe. 4,411,656., Cl. 604-212.000.
Corning Glass Works: *See*—
Montierth, Max R., 4,411,856., Cl. 264-267.000.
Cornish, Darrel G.; and Hartl, Carroll P., to Oscar Mayer & Co., Inc. Apparatus and method for pressure resizing of products. 4,411,122., Cl. 53-436.000.
Correale, James V.: *See*—
Dawn, Frederic S.; and Correale, James V., 4,411,660., Cl. 604-396.000.
Corwin, Michael A.; and Foster, George N., to Union Carbide Corporation. Anti-block compounds for extrusion of transition metal catalyzed resins. 4,412,025., Cl. 524-241.000.
Cosentino, Cesare C.: *See*—
Madonia, Ciro; Hatzikelis, Christopher; and Cosentino, Cesare C., 4,411,938., Cl. 428-31.000.
Cosman, Eric R. Thermocouple radio frequency lesion electrode. 4,411,266., Cl. 128-303.180.
Coulange, Jean, to e.d. Veglia. Sensor for detecting the level of liquid in a tank. 4,411,155., Cl. 73-295.000.
Coulter Electronics, Inc.: *See*—
Maynarez, Franklin D., 4,412,175., Cl. 324-71.100.
Couture, Guy. Jewelry clasp. 4,411,050., Cl. 24-234.000.
Couvillion, Paul L.; and Ray, James E., to Jim Ray Company, Inc. Sealing member with anti-extrusion means and protective coating. 4,411,439., Cl. 277-188.00A.
Cox, James A., to Medtronic, Inc. Muscle stimulator. 4,411,268., Cl. 128-421.000.
Cox, Robert D.; and Frank, Clyde W., to University of Iowa Research Foundation. Method for determination of nitrate and/or nitrite. 4,412,006., Cl. 436-110.000.
Craddock, Charles F.: *See*—
Poppe, Wassily; Craddock, Charles F.; Gutekunst, Robert W.; Ladd, Robert G.; and Mager, Sue A., 4,411,610., Cl. 425-174.400.
Craighead, Harold G.: *See*—
Beni, Gerardo; Craighead, Harold G.; and Hackwood, Susan, 4,411,495., Cl. 350-347.00V.
Cram, Ronald P.: *See*—
Jones, Bradley N.; Harris, Robert J.; Cram, Ronald P.; and Huber, Gene A., 4,411,673., Cl. 55-41.000.
Crane, Dennis P., to Ofrex Group Limited. Document shredding machines. 4,411,391., Cl. 241-232.000.
Craycraft, Donald G.: *See*—
Patella, James F.; and Craycraft, Donald G., 4,412,143., Cl. 307-530.000.
Crider, Chester H.; and Linton, Charles R., to International Business Machines Corporation. Stepper motor drive circuit for synchronous switching of core winding. 4,412,166., Cl. 318-696.000.
Crinos Industria Farmabiologica, S.p.A.: *See*—
Casu, Benito; Torri, Giangiacomo; and Zoppetti, Giorgio, 4,411,796., Cl. 210-692.000.
Cristea, Norm E. Retainer strap. 4,411,049., Cl. 24-20.0EE.
Cronin, James A.: *See*—
Meredith, Douglas; and Cronin, James A., 4,411,667., Cl. 8-471.000.
Cronshaw, David: *See*—
Neches, Philip M.; Hartke, David H.; Stockton, Richard C.; Watson, Martin C.; Cronshaw, David; and Shemer, Jack E., 4,412,285., Cl. 364-200.000.
Crook, Edward J., Jr., to Crosby Group, The. Wire rope to chain connector for anchoring systems. 4,411,132., Cl. 59-85.000.
Crosby Group, The: *See*—
Crook, Edward J., Jr., 4,411,132., Cl. 59-85.000.
Cross, Leslie E.: *See*—
Klicker, Kenneth A.; Newnham, Robert E.; Cross, Leslie E.; and Biggers, James V., 4,412,148., Cl. 310-358.000.
Crossland, William A.; and Coates, David, to International Standard Electric Corporation. Roughening surfaces for homeotropic layers of smectic LCD's. 4,411,494., Cl. 350-339.00R.
Cuatrecasas, Pedro; and Parikh, Indu. Polysaccharide matrices comprising macromolecular spacer arms for use as adsorbents in affinity chromatography techniques. 4,411,832., Cl. 260-121.000.
Cullen, Walter P.: *See*—
Celmer, Walter D.; Cullen, Walter P.; Shibakawa, Riichiro; and Tone, Junsuke, 4,411,892., Cl. 424-181.000.
Cummins, William T.: *See*—
Leblanc, Raymond F.; and Cummins, William T., 4,411,556., Cl. 405-213.000.
Cunnion, James P., Jr.: *See*—
Netting, David I.; Spivack, Bruce D.; and Cunnion, James P., Jr., 4,411,847., Cl. 264-7.000.
Currah, Walter E.: *See*—
Currah, Walter E., Jr., 4,411,588., Cl. 415-2.00A.
Currah, Walter E., Jr., to Currah, Walter E. Wind driven power plant. 4,411,588., Cl. 415-2.00A.
Curtis, Nikolaus A.; and Karner, James E., to Mile-Age Research Corporation. Cylinder deactivation device. 4,411,229., Cl. 123-198.00F.
Cuscurida, Michael: *See*—
McCoy, David R.; Cuscurida, Michael; and Speranza, George P., 4,411,775., Cl. 208-188.000.
CX Corporation: *See*—
Siegel, John H.; and Edwards, Gerald L., 4,411,725., Cl. 156-353.000.
Cynex Manufacturing Corporation: *See*—
Green, Dan; and Goldner, Sandor, 4,412,167., Cl. 318-729.000.
Cyphelly, Ivan J. Decanter centrifuge having differential drive unit. 4,411,646., Cl. 494-53.000.
Cziptschirsch, Kurt; Kaiser, Klaus-Peter; and Zwirner, Gerhard, to Gebr. Happich GmbH. Foil covering layer for sun visor. 4,411,467., Cl. 296-97.00H.
Dahlgren Manufacturing Company: *See*—
Hess, Max W., 4,411,193., Cl. 101-148.000.
Daimler-Benz AG: *See*—
Ableitner, Erich; Conrad, Ulrich; Derndinger, Hans-Otto; and Niemeier, Gerd, 4,411,237., Cl. 123-501.000.
Hardenberg, Horst; and Bergmann, Horst, 4,411,243., Cl. 123-577.000.
Daly, Charles L. Process and apparatus for thermally drying oil well cuttings. 4,411,074., Cl. 34-32.000.
Damadian, Raymond V. Apparatus and method for nuclear magnetic resonance scanning and mapping. 4,411,270., Cl. 128-653.000.
Daniel, Maurice. Apparatus for collecting, distributing and utilizing solar radiation. 4,411,490., Cl. 350-96.100.
Darnell, Robert D.; Goetz, Carl A.; and Ingle, William M., to Motorola, Inc. Flange and coupling cooling means and method. 4,411,619., Cl. 432-1.000.
Dart Industries Inc.: *See*—
Dassow, Edgar E., 4,412,268., Cl. 361-181.000.
Dassow, Edgar E., to Dart Industries Inc. Safety switch system for industrial machines. 4,412,268., Cl. 361-181.000.
Datta, Amitava; and Stroble, Carl P., to Allegheny Ludlum Steel Corporation. Method for improving the magnetic properties of grain oriented silicon steel. 4,411,714., Cl. 148-111.000.
Daumal, Jeanne: *See*—
Voegele, Jean D.; Jourdheuil, Pierre E. J.; and Daumal, Jeanne, 4,411,220., Cl. 119-1.000.
Davidson, William W., Jr., to North Shore Precision Research Corporation. Printing press. 4,411,194., Cl. 101-216.000.
Davis, Burlin: *See*—
Clapper, Allen R.; and Davis, Burlin, 4,411,061., Cl. 29-622.000.
Davis, Charles P.; Warren, Michael M.; and Arnett, David W., to Board of Regents, The University of Texas System. Iontophoretic catheter device. 4,411,648., Cl. 604-21.000.
Davis, Pauls: *See*—
Panek, Edward J.; and Davis, Pauls, 4,411,819., Cl. 252-315.100.
Davis, Steven C.: *See*—
Klein, Dean A.; Davis, Steven C.; and Wroblewski, Jerome J., 4,411,150., Cl. 72-461.000.
Dawless, Robert K.; Bowman, Kenneth A.; Mazgaj, Robert M.; and Cochran, C. Norman, to Aluminum Company of America. Process of electrolysis and fractional crystallization for aluminum purification. 4,411,747., Cl. 204-67.000.
Dawn, Frederic S.; and Correale, James V., to United States of America, National Aeronautics and Space Administration. Absorbent product and articles made therefrom. 4,411,660., Cl. 604-396.000.
Dayco Corporation: *See*—
Wilson, Leslie B., 4,411,638., Cl. 474-138.000.
Daykin, Theodore W.: *See*—
Watanabe, Shunso F.; Daykin, Theodore W.; and Heiney, Elmer T., III, 4,411,231., Cl. 123-339.000.
De Greef's Wagen-, Carrosserie- en Machinebouw B.V.: *See*—
De Greef, Jan A., 4,411,366., Cl. 209-648.000.
De Regt Special Cable B.V.: *See*—
Asjes, Ronald J.; van Peppen, Jacobus C. L.; and Klaassen, Klaas B., 4,412,317., Cl. 367-185.000.
de Castella, Pierre. Apparatus for the purification of gases. 4,411,675., Cl. 55-316.000.
Deen, Harold E.: *See*—
Gutierrez, Antonio; Brois, Stanley J.; Ryer, Jack; and Deen, Harold E., 4,411,808., Cl. 252-78.100.
Deere & Company: *See*—
Haight, Robert E.; and Tjepkes, Kendall D., 4,411,345., Cl. 192-12.00C.
Kolegraff, Kenneth J.; and Allen, David T., 4,412,212., Cl. 340-684.000.
Dees, John R.: *See*—
Bromley, James E.; and Dees, John R., 4,411,852., Cl. 264-171.000.
Degner, Dieter; Roos, Hans; and Hannebaum, Heinz, to BASF Aktiengesellschaft. Preparation of alkyl-substituted benzaldehydes. 4,411,746., Cl. 204-59.00R.

De Greef, Jan A., to De Greef's Wagen-, Carrosserie- en Machinebouw B.V. Device for grading products. 4,411,366., Cl. 209-648.000.

Degussa: *See*—
Kreuter, Erika; and Zilske, Wolfgang, 4,411,743., Cl. 204-47.000.

Degussa Aktiengesellschaft: *See*—
Amann, Herbert; and Morlock, Gerhard, 4,412,067., Cl. 528-232.000.
Bethge, Horst; Kleemann, Axel; and Martens, Jurgen, 4,411,840., Cl. 260-501.120.
Grimm, Dieter, 4,411,537., Cl. 374-185.000.

de Jager, Arie, to IHC Holland N.V. Suction drag system. 4,411,079., Cl. 37-58.000.

DeJovine, James M.: *See*—
DeVries, Donald L.; and DeJovine, James M., 4,411,804., Cl. 252-29.000.

de Klein, Willem J.: *See*—
Hageman, Hendrik J.; de Klein, Willem J.; and Giezen, Egenius A., 4,411,823., Cl. 502-168.000.

DeLeon, Alberto: *See*—
Snider, Scott C.; and DeLeon, Alberto, 4,411,949., Cl. 428-304.400.

Dell'Orto, Giuseppe, to Marelli Autronica S.p.A. Circuit for detecting and indicating faults and operating anomalies in a system for recharging electric accumulators. 4,412,169., Cl. 320-64.000.

Dell'Orto, Pierluigi, to Dell'Orto S.p.A. Oil pump for internal combustion engines. 4,411,225., Cl. 123-73.0AD.

Dell'Orto S.p.A.: *See*—
Dell'Orto, Pierluigi, 4,411,225., Cl. 123-73.0AD.

Delorme, Raymond L., to Compagnie Internationale pour l'Informatique Cii Honeywell Bull. Machine for bending conductors of a semiconductor chip device. 4,411,149., Cl. 72-385.000.

Del Sere, Giannetto: *See*—
Tironi, Maurizio G.; Barbini, Mario; and Del Sere, Giannetto, 4,412,334., Cl. 373-40.000.

Delta Electronics, Inc.: *See*—
Wright, Charles S., 4,412,349., Cl. 455-67.000.

DeLuca, Hector F.; Tanaka, Yoko; Ikekawa, Nobuo; and Kobayashi, Yoshiro, to Wisconsin Alumni Research Foundation. Method for preparing 26,26,26,27,27,27-hexafluoro-1α,25-dihydroxycholesterol. 4,411,833., Cl. 260-239.55R.

de Man, Hendrikus C. J.; and Smids, Petrus T. J. L., to Stamicarbon B.V. Bromine-containing polymer and process of preparing a bromine-containing polymer. 4,412,051., Cl. 526-293.000.

DeMarco, Michael, to United States of America, Navy. Variable speed reducing and torque transmitting system. 4,411,172., Cl. 74-690.000.

Demianczuk, Dionisyj W.; McLean, Gregory J.; and Franklin, Joseph E., to Republic Steel Corporation. Production of steel products with medium to high contents of carbon and manganese and superior surface quality. 4,411,056., Cl. 29-527.700.

Demoute, Jean-Pierre: *See*—
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,412,069., Cl. 542-429.000.

Denaro, James J. Compound jaw plate. 4,411,415., Cl. 269-134.000.

Denero, Anthony D.: *See*—
Stricklin, John D.; Denero, Anthony D.; Quatro, Robert A.; and Duff, James A., 4,412,260., Cl. 360-97.000.

Denisov, Vladimir A.; Kulevskaya, Elena F.; Zhiltsov, Jury S.; Kuznetsova, Olga M.; Novakovskaya, Zoya D.; Kozlov, Vyacheslav I.; Korol, Vyacheslav K.; and Pershin, Nikolai I., to Moskovsky Energeticheskiy Institut; Pervy Moskovsky Cashovoizavod im. S. M. Kirova; and V. M. Chasovoi. Single-phase step motor. 4,412,144., Cl. 310-49.00R.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Shigesada, Shigeki; Kitagawa, Hironoshin; Mihara, Toshio; and Ishimatsu, Yoshiaki, 4,411,999., Cl. 435-177.000.

Dennison Manufacturing Company: *See*—
Jodrey, Robert M.; and Scott, Robert J., 4,411,393., Cl. 242-75.430.

Dentsply Research & Development Corp.: *See*—
Koblitz, Franics F.; and Reichart, Jane L., 4,411,625., Cl. 433-217.000.

Derkacs, Thomas; Fetheroff, Charles W.; Matay, Istvan M.; and Toth, Istvan J., to TRW Inc. Airfoil. 4,411,940., Cl. 428-73.000.

Derndinger, Hans-Otto: *See*—
Ableitner, Erich; Conrad, Ulrich; Derndinger, Hans-Otto; and Niemeier, Gerd, 4,411,237., Cl. 123-501.000.

DeSantis, Raymond P., to PTX-Pentronix, Inc. Method for compacting articles made of powder material at a predetermined density. 4,411,848., Cl. 264-40.500.

Desbois, Michel: *See*—
Baudouin, Michel; and Desbois, Michel, 4,412,075., Cl. 546-153.000.

Desbrandes, Robert, to Institut Francais du Petrole. Method and device with adjustable focusing for measuring the electric resistivity of geological formations. 4,412,180., Cl. 324-373.000.

Desiage, Christian: *See*—
Marcheix, Raymond; and Desiage, Christian, 4,411,441., Cl. 280-5.00A.

Desiro, Richard. Radiator recoring fixturing and tools. 4,411,414., Cl. 269-71.000.

DeSoto, Inc.: *See*—
Gaske, Joseph E.; Plaisance, Thomas H.; and Sekmakas, Kazys, 4,412,032., Cl. 524-538.000.

Dettbarn, Hans-Jurgen; and Zimmermann, Josef, to Hoechst Aktiengesellschaft. Piston pump for needle-less injection instruments. 4,411,650., Cl. 604-72.000.

Deutsch, Ralph, to Kawai Musical Instrument Mfg. Co., Ltd. Touch responsive keyboard electronic musical instrument. 4,411,185., Cl. 84-1.270.

Development Finance Corp of New Zealand: *See*—
Hiscock, Donald C., 4,411,206., Cl. 111-34.000.

Devin, Paul W. Ash hood. 4,411,253., Cl. 126-242.000.

Devreux, Andre F. O.; and Jeramanis, Janis, to Compagnie Internationale de Participation et d'Investissement Cipari S.A. Process for the production of a colloidally stable beer. 4,411,914., Cl. 426-12.000.

DeVries, Donald L.; and DeJovine, James M., to Atlantic Richfield Company. Solid particles containing lubricating oil composition. 4,411,804., Cl. 252-29.000.

Devro, Inc.: *See*—
Green, Edward A. T., 4,411,048., Cl. 17-49.000.

DewEze Manufacturing, Inc.: *See*—
Hostetler, Dewey, 4,411,572., Cl. 414-24.500.

Diamond Automations, Inc.: *See*—
Riley, Douglas E., 4,411,574., Cl. 414-121.000.

Diamond Shamrock Corporation: *See*—
Kline, George A., 4,411,762., Cl. 204-290.00F.

Dian, Walter, to Walter Dian, Inc. Golf putter. 4,411,430., Cl. 273-171.000.

Dickens, Duane D.; and Servas, Francis M., to Shiley Incorporated. Arterial blood filter with improved gas venting. 4,411,783., Cl. 210-304.000.

Dickhudt, Eugene A.; and Paulson, Roger A., to Medtronic, Inc. Implantable multiple connector. 4,411,276., Cl. 128-784.000.

Dickhudt, Eugene A., to Medtronic, Inc. Implantable connector. 4,411,277., Cl. 128-784.000.

Dickinson, Peter J.: *See*—
Parker, Alan; and Dickinson, Peter J., 4,411,129., Cl. 57-228.000.

Didier-Werke AG: *See*—
Neumann, Ernst-Georg, 4,411,616., Cl. 431-114.000.

Diebold Incorporated: *See*—
Anders, Walter G., 4,411,336., Cl. 186-37.000.

Diederich, Anthony F., Jr.; Haldeman, Peter P.; and Campbell, Willis R., to Sperry Corporation. Floating windguard. 4,411,127., Cl. 56-364.000.

Diepers, Heinrich, to Siemens Aktiengesellschaft. Ultrasonic transducer arrangement. 4,412,316., Cl. 367-105.000.

Dietz, Lloyd H.: *See*—
Perry, Clifford R.; Dietz, Lloyd H.; and Shannon, Roger L., 4,411,310., Cl. 165-166.000.

Digital Equipment Corporation: *See*—
Lipcon, Jesse B., 4,412,347., Cl. 455-58.000.

Disbrow, Lynnford E. Apparatus for controlling spray pattern. 4,411,386., Cl. 239-177.00R.

Disco Co., Ltd.: *See*—
Sekiya, Shinji; and Ono, Takatoshi, 4,411,107., Cl. 51-209.00R.

Dixon, George D.; Carlson, Nancy W.; and Saunders, Howard E., to Westinghouse Electric Corp. Solventless UV dryable B-stageable epoxy adhesive. 4,412,048., Cl. 525-524.000.

Dr. Ing. h.c.F. Porsche AG: *See*—
Striebich, Helmut, 4,411,135., Cl. 60-616.000.

Doern, Klaus, to Wik Elektro-Hausgerate Vertriebsgesellschaft mbH & Co., Productions-KG. Hairdressing device for styling, winding and drying hair. 4,411,281., Cl. 132-37.00R.

Domeniconi, Michael, to Altus Corporation. Current collector manufacturing process for an electrochemical cell. 4,411,825., Cl. 252-503.000.

Donakowski, William A.; and Morgan, John R., to Ford Motor Company. Electrolytic codeposition of zinc and graphite and resulting product. 4,411,742., Cl. 204-16.000.

Donaldson, A. Burl; Hoke, Donald E.; and Mulac, Anthony J. Downhole steam generator with improved preheating/cooling features. 4,411,618., Cl. 431-190.000.

Donoian, Gary S.: *See*—
Valsamis, Lefteris N.; Yang, Jan-Chin; and Donoian, Gary S., 4,411,532., Cl. 366-99.000.

Dorr-Oliver Inc.: *See*—
Evans, Richard R., 4,412,003., Cl. 435-287.000.

Doss, Harry L. Grading machine. 4,411,323., Cl. 172-799.500.

Double A Products Company: *See*—
Teichert, Rainer, 4,412,196., Cl. 335-250.000.

Dougherty, James R.: *See*—
Blacklin, Peter A.; Dougherty, James R.; Johnson, Richard J.; and Tate, Donald L., 4,411,121., Cl. 52-792.000.

Dougherty, Timothy S.; Kissell, John J.; and Schmehl, Glenn L., to Western Electric Company, Inc. Compositely insulated conductor riser cable. 4,412,094., Cl. 174-110.00F.

Dow Chemical Company, The: *See*—
Bermudez, Mauricio; Klimpel, Richard R.; and Sands, Steven D., 4,411,927., Cl. 426-618.000.
Hefner, Robert E., Jr., 4,412,055., Cl. 528-99.000.

Dow Corning Corporation: *See*—
Flaningam, Ora L.; and Halm, Roland L., 4,411,740., Cl. 203-58.000.

Dowa Mining Co., Ltd.: *See*—
Watanabe, Yasuo; Isoyama, Seiji; and Bannou, Masahiko, 4,411,807., Cl. 252-62.580.

Dowty Mining Equipment Limited: *See*—
Rutherford, Dennis F., 4,411,558., Cl. 405-294.000.

Drabert, Fritz; Posch, Oskar; Edel, Hans-Joachim; and Schroeder, Bernhard, to Drabert Sohne. Chair, particularly a data display chair. 4,411,469., Cl. 297-300.000.

Drabert Sohne: *See*—
Drabert, Fritz; Posch, Oskar; Edel, Hans-Joachim; and Schroeder, Bernhard, 4,411,469., Cl. 297-300.000.

Drago, William R.: *See*—
Babin, Eugene R.; and Drago, William R., 4,411,157., Cl. 73-864.810.

Dreishev, Igor I.: *See*—
Zitser, Vitaly A.; Bachelis, Leonid V.; Melnikov, Alexandr V.; Dreishev, Igor I.; Shishkin, Nikolai K.; Morozov, Jury E.; Ivanov, Vladimir A.; Olshansky, Semen A.; and Ryabinin, July V., 4,411,586., Cl. 414-728.000.

Drescher, Heinz H.: *See*—
Schwirn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Drescher, Heinz H., 4,411,794., Cl. 210-670.000.

Drew, John W.; and Swift, Joe M. Offset putter. 4,411,429., Cl. 273-164.000.

Driall, Inc.: *See*—
Applegate, Robert D., 4,411,620., Cl. 432-29.000.

Drummond, Denis S. Apparatus for engaging a hook assembly to a spinal column. 4,411,259., Cl. 128-69.000.

Dubix: *See*—
Ferrage, Francois, 4,411,082., Cl. 38-9.000.

Dubois, Gilles; and Hulin, Jean P., to Lignes Telegraphiques et Telephoniques. Head for the simultaneous laying of optical fibers within a grooved cylindrical support. 4,411,130., Cl. 57-352.000.

Duda, Eugene; Tondu, Claude; and Maumy, Alain, to Thomson-CSF. Method of manufacturing a laser source with stamped support. 4,411,057., Cl. 29-569.00L.

Dudley, Kenneth W.; Teich, Wesley W.; and Bowen, Robert F., to Raytheon Company. Microwave oven feed system. 4,412,117., Cl. 219-10.55F.

Duerig, Thomas: *See*—
Albrecht, Joachim; Duerig, Thomas; and Schroeder, Gunther, 4,411,711., Cl. 148-11.50A.

Duff, Charles B.: *See*—
Stout, Daniel M.; and Duff, Charles B., 4,411,093., Cl. 43-114.000.

Duff, James A.: *See*—
Stricklin, John D.; Denero, Anthony D.; Quatro, Robert A.; and Duff, James A., 4,412,260., Cl. 360-97.000.

Duke University: *See*—
Krigbaum, William R.; Ciferri, Alberto; and Preston, Jack, 4,412,059., Cl. 528-192.000.

Duncan, Eugene F., to Eaton Corporation. Adjustable photoelectric detector head for solid state limit switch. 4,412,129., Cl. 250-239.000.

Dunlap, Richard M., to United States of America, Navy. Heat driven heat pump using paired ammoniated salts. 4,411,384., Cl. 237-2.00B.

Dunn, Aubrey J.: *See*—
Durenec, Peter; and Dunn, Aubrey J., 4,411,164., Cl. 74-55.000.

Dunnavant, William R.: *See*—
Gruber, Bruce A.; Koch, Diether; Langer, Heimo J.; and Dunnavant, William R., 4,412,088., Cl. 585-23.000.

Duong, Chau H., to Armstrong World Industries, Inc. Multiple step UV curing process for providing accurately controlled surface texture. 4,411,931., Cl. 427-54.100.

Du Pont de Nemours, E. I., and Company. *See*—
Barsotti, Robert J., 4,411,951., Cl. 428-328.000.
Feathers, William D., 4,411,614., Cl. 425-166.000.
Haney, Douglas M.; and Lott, John W., 4,411,980., Cl. 430-291.000.
Howard, Edward G., Jr., 4,411,821., Cl. 502-117.000.
Pazos, Jose F., 4,412,043., Cl. 525-328.200.
Regenstein, Klaus J., 4,411,142., Cl. 66-196.000.
Siemionko, Roger L., 4,412,058., Cl. 528-191.000.
Silva, Raimund H.; and Smith, Roger A., 4,411,750., Cl. 204-98.000.
Tseng, Chi-Ping, 4,411,690., Cl. 71-92.000.

Durant, Will G., to W. G. Durant Corporation. Valve bag placer. 4,411,296., Cl. 141-98.000.

Durenec, Peter; and Dunn, Aubrey J., to United States of America, Army. Rotary to reciprocating motion translator. 4,411,164., Cl. 74-55.000.

Durenec, Peter, to United States of America, Army. Spring loaded piston seal assembly. 4,411,436., Cl. 277-53.000.

Durr-Dental GmbH & Co., KG: *See*—
Schutt, Peter; Bernhardt, Martin; Nitsche, Klaus; Grindler, Horst; and Hofmann, Hans-Joachim, 4,411,550., Cl. 403-358.000.

Duruz, Louis; and Furrer, Alfred, to Raskin, S.A. Machine for cutting sheet material. 4,412,120., Cl. 219-121.0LG.

Duschl, Bernhard: *See*—
Glasauer, Rudolf; Duschl, Bernhard; Linzmeier, Wilhelm; and Schaffrik, Arnold, 4,412,201., Cl. 336-192.000.

Dutton, Daniel R.; Parker, Edward J.; Ott, Roger A.; and Otten, Jay G., to BASF Wyandotte Corporation. Low-foaming nonionic surfactant for machine dishwashing detergent. 4,411,810., Cl. 252-99.000.

Dynabrade, Inc.: *See*—
Fleckenstein, Elwin H.; and Welsch, Walter N., 4,411,106., Cl. 51-170.0EB.

Dynamit Nobel Aktiengesellschaft: *See*—
Brede, Uwe; Penner, Horst; Stahlmann, Rudolf; and Zeiher, Erich, 4,411,200., Cl. 102-529.000.
Gauchel, Peter; and Kurth, Josef, 4,411,613., Cl. 425-388.000.

e.d. Veglia: *See*—
Coulange, Jean, 4,411,155., Cl. 73-295.000.

Easley, Othel D., Jr.; and Wooten, John T., to Reactor Services International, Inc. For removing particles from a tube by means of a missile. 4,411,705., Cl. 134-8.000.

Eastman Kodak Company: *See*—
Abbott, Thomas I.; and Jones, Cynthia, 4,411,986., Cl. 430-502.000.
Gabrielsen, Rolf S., 4,411,984., Cl. 430-351.000.
Gilmour, Hugh S. A.; and Blazey, Richard N., 4,411,973., Cl. 430-7.000.
Morrow, Lawrence R.; and Thatcher, John, 4,411,985., Cl. 430-352.000.
Wu, Tai-Wing, 4,412,005., Cl. 436-97.000.

Eaton Corporation: *See*—
Duncan, Eugene F., 4,412,129., Cl. 250-239.000.
Hamilton, Martin W., 4,411,325., Cl. 177-136.000.
Hansen, James E.; and Smith, Richard G., 4,412,137., Cl. 307-10.00R.
Hansen, James E., 4,412,267., Cl. 361-94.000.

Ebauches, S.A.: *See*—
Portmann, Hubert, 4,412,215., Cl. 340-785.000.

Echte, Adolf: *See*—
Brandstetter, Franz; Echte, Adolf; Gausepohl, Hermann; and Naarmann, Herbert, 4,412,037., Cl. 525-68.000.

Ecker, Amir L., to Atlantic Richfield Company. Wound tube heat exchanger. 4,411,307., Cl. 165-70.000.

Eckes, William A.; Rhoades, Russell H.; Vorreiter, John W.; Wiesner, John C.; and Shepard, Charles E., to Perkin-Elmer Corp., The. Electrostatic cassette. 4,412,133., Cl. 250-492.200.

Eckstein, Helmut: *See*—
Kremer, Karl J.; Brauner, Jochen; Glaubitz, Klaus-Dieter; Eckstein, Helmut; and Bruggemann, Josef, 4,411,524., Cl. 356-313.000.

Ecodyne Corporation: *See*—
Yu, Steven P.; Matunas, Frank C.; and Zwetkow, Nikolaus, 4,411,785., Cl. 210-321.100.

Ecomard, Andre; and Briand, Louis, to Institut Francais du Petrole. Pump-injector device for an internal combustion engine. 4,411,238., Cl. 123-501.000.

Edamatu, Mitisuke: *See*—
Nakazima, Atushi; and Edamatu, Mitisuke, 4,411,930., Cl. 427-54.100.

Edel, Hans-Joachim: *See*—
Drabert, Fritz; Posch, Oskar; Edel, Hans-Joachim; and Schroeder, Bernhard, 4,411,469., Cl. 297-300.000.

Edeleanu, Constantin: *See*—
Conlon, Thomas W.; and Edeleanu, Constantin, 4,412,174., Cl. 324-65.0CR.

Edgerton, Bradly J.; House, William F.; and Michaels, Robert C., to Minnesota Mining and Manufacturing Company. Combination earmold and receiver adapter. 4,412,096., Cl. 381-60.000.

Edson, James B.: *See*—
Lautzenheiser, William J.; Simonetti, Richard A.; Henderson, Martin E.; Edson, James B.; and Beeson, Kenneth E., 4,412,211., Cl. 340-514.000.

Edwards, Gerald L.: *See*—
Siegel, John H.; and Edwards, Gerald L., 4,411,725., Cl. 156-353.000.

Edwards, Ivan L.: *See*—
Khan, Ashfaq R.; and Edwards, Ivan L., 4,412,342., Cl. 375-107.000.

Efstratiadis, Argiris A.: *See*—
Gilbert, Walter; Broome, Stephanie A.; Villa-Komaroff, Lydia J.; and Efstratiadis, Argiris A., 4,411,994., Cl. 435-71.000.

Egli, Hermann; and Engeler, Emil, to Sandoz Ltd. Dyeing process using alkoxylated fatty amines and polyamines as reserving agents. 4,411,665., Cl. 8-455.000.

Eguchi, Kiyoshi: *See*—
Ishikawa, Takayoshi; Genba, Yasushi; Tamaru, Shigemi; and Eguchi, Kiyoshi, 4,412,112., Cl. 200-50.0AA.

Ehemann, Gero, to Kurt Ehemann Spezialmaschinenfabrik KG. Process for heat treating textile material items. 4,411,051., Cl. 26-18.500.

Ehrlich, Shelton; and Aulisio, Callixtus, to Electric Power Research Institute. Method for enhancing the sulfur capture potential of lime using a filter means in the flue gas. 4,411,879., Cl. 423-640.000.

Eibeck, Richard E.: *See*—
Anello, Louis G.; Eibeck, Richard E.; and Robinson, Martin A., 4,411,843., Cl. 260-544.00Y.

Eichelsheim, Alexander V., to Applied Power Inc. Tiltcab truck with a safety latch cylinder. 4,411,332., Cl. 180-89.140.

Eichenlaub, John E. Ear wax removing device. 4,411,265., Cl. 128-303.100.

Eigenmann, Ludwig. Retro-reflecting globules for road surface marking. 4,411,553., Cl. 404-16.000.

Ekholm, David T., to Bell Telephone Laboratories, Incorporated. Magnetic bubble detector. 4,412,307., Cl. 365-8.000.

Electric Power Development Co.: *See*—
Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; and Wakabayashi, Takeshi, 4,411,765., Cl. 208-8.0LE.

Electric Power Research Institute: *See*—
Ehrlich, Shelton; and Aulisio, Callixtus, 4,411,879., Cl. 423-640.000.

Electro Scientific Industries, Inc.: *See*—
Mauck, Michael S.; and Neeland, William S., 4,412,330., Cl. 372-29.000.

Elettromeccanica Tironi S.r.l.: *See*—
Tironi, Maurizio G.; Barbini, Mario; and Del Sere, Giannetto, 4,412,334., Cl. 373-40.000.

Elfes, Lee E.: *See*—
Wood, Dale A.; and Elfes, Lee E., 4,411,319., Cl. 172-10.000.

Eli Lilly and Company: *See*—
Abdulla, Riaz F., 4,411,753., Cl. 204-158.00R.

Ellingsen, Raymond L.; and Manteufel, Dale A., to J. I. Case Company. Log splitter mounting arrangement. 4,411,298., Cl. 144-193.00A.

Elliott, James F.; Richter, George N.; and Estabrook, Lawrence E., to Texaco Inc. Production of synthesis gas. 4,411,817., Cl. 212-373.000.

Ellis, Billy H.; and Ellis, Randall. Aluminum shingle accesories. 4,411,120., Cl. 52-748.000.

Ellis, Randall: *See*—
Ellis, Billy H.; and Ellis, Randall, 4,411,120., Cl. 52-748.000.

Elmo Company, Limited: *See*—
Ota, Masataka, 4,412,156., Cl. 315-308.000.

Elmquist, Lyle F.: *See*—
Pedersen, Lee C.; and Elmquist, Lyle F., 4,412,036., Cl. 525-54.260.

Embree, Milton L., to Bell Telephone Laboratories, Incorporated. Precision isolation amplifier. 4,412,184., Cl. 330-69.000.

Emerson Electric Company: *See*—
Carnahan, John T., 4,411,561., Cl. 406-137.000.
Clapper, Allen R.; and Davis, Burlin, 4,411,061., Cl. 29-622.000.
Munoz, John, 4,411,850., Cl. 264-105.000.

Endo, Masao: *See*—
Saito, Masumi; Hirai, Eiichi; and Endo, Masao, 4,411,701., Cl. 106-87.000.

Endo, Toshiyuki: *See*—
Kato, Michio; Endo, Toshiyuki; and Nomura, Junji, 4,411,793., Cl. 210-656.000.

Endo, Yasushi: *See*—
Nagura, Masato; Kikuchi, Kazushige; Obara, Hiroshi; and Endo, Yasushi, 4,412,147., Cl. 310-320.000.

Engelbrecht, Jurgen: *See*—
Lustgarten, Stewart J.; and Engelbrecht, Jurgen, 4,412,015., Cl. 523-116.000.

Engeler, Emil: *See*—
Egli, Hermann; and Engeler, Emil, 4,411,665., Cl. 8-455.000.

Engelmaier, Werner: *See*—
Ammann, Hans H.; Bonanni, Rocco; and Engelmaier, Werner, 4,412,123., Cl. 219-233.000.

Engert, Richard E.: *See*—
Klipstein, Frederick A.; Engert, Richard E.; and Clements, John D., 4,411,888., Cl. 424-92.000.

English, Donald H., to Hewing Manufacturing Corporation. Watertight conduit well cap. 4,411,312., Cl. 166-75.00R.

Enlow, William P.: *See*—
Hechenbleikner, Ingenuin; and Enlow, William P., 4,411,842., Cl. 260-543.00P.

Erhardt, Peter F.: *See*—
Lu, Chin H.; Au Clair, Christopher J.; and Erhardt, Peter F., 4,411,974., Cl. 430-106.000.

Eriksson, Caj. Heme-iron-enriched amino acid and a process for the preparation of heme-iron-enriched amino acid. 4,411,915., Cl. 426-32.000.

Ernst, Horst M.: *See*—
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Ernst, Horst M., 4,411,478., Cl. 308-6.00C.

Ernst Leitz Wetzlar GmbH: *See*—
Faatz, Rudi; Moeller, Siegfrid; Ruehl, Friedel; and Steuernagel, Adolf, 4,411,510., Cl. 354-272.000.

Escuret, Pierre: *See*—
Godbille, Etienne; Escuret, Pierre; and Scheid, Jean-Pierre, 4,411,658., Cl. 604-285.000.

Esmond, William G. Stacked plate transfer device. 4,411,784., Cl. 210-321.100.

ESPE Fabrik Pharmazeutischer Praeparate GmbH: *See*—
Herold, Wolf-Dietrich; Grafwallner, Karl L.; and Keller, Michael, 4,412,134., Cl. 250-504.00R.

Essilor International: *See*—
Tagnon, Luc A., 4,411,501., Cl. 351-202.000.

Estabrook, Lawrence E.: *See*—
Elliott, James F.; Richter, George N.; and Estabrook, Lawrence E., 4,411,817., Cl. 212-373.000.

Estel Hoesch Werke Aktiengesellschaft: *See*—
Roll, Werner, 4,411,152., Cl. 73-46.000.

Estwanik, Joseph J., III. Exercise device and exercise adapter for forming same. 4,411,423., Cl. 272-117.000.

Etat Francais: *See*—
Glowinsky, Albert; and Lucas, Pierre M., 4,412,324., Cl. 370-58.000.
Terrien, Michel E.; and Bouvet, Claude, 4,411,037., Cl. 14-2.600.

Ettridge, John P. Webbing harness restraints. 4,411,473., Cl. 297-484.000.

Eumurian, Charles: *See*—
Newcomb, James S.; and Eumurian, Charles, 4,411,528., Cl. 356-375.000.

Evans, Lyle B. Power transmission unit with infinite speeds. 4,411,165., Cl. 74-63.000.

Evans, Richard R., to Dorr-Oliver Inc. Integral flow circulator for fluid bed reactor. 4,412,003., Cl. 435-287.000.

Everett, Lynn E., to Tusco Manufacturing Co. Shelving system. 4,411,400., Cl. 248-216.100.

Ex-Cell-O Corporation: *See*—
Kunkel, Harold E., 4,411,309., Cl. 165-76.000.

Excel Corporation: *See*—
Furlette, James L.; and Stadler, Donald A., 4,411,355., Cl. 198-718.000.

Exxon Research & Engineering Co.: *See*—
Gutierrez, Antonio; Brois, Stanley J.; Ryer, Jack; and Deen, Harold E., 4,411,808., Cl. 252-78.100.
Lundberg, Robert D.; Phillips, Robert R.; and McDougall, Lee A., 4,412,028., Cl. 524-364.000.
Oldweiler, Morey E., 4,411,769., Cl. 208-54.000.
Schucker, Robert C.; and Wheelock, Kenneth S., 4,411,772., Cl. 208-121.000.
Tirtiaux, Robert; and Lenack, Alain L. P., 4,411,806., Cl. 252-49.600.

Faatz, Rudi; Moeller, Siegfrid; Ruehl, Friedel; and Steuernagel, Adolf, to Ernst Leitz Wetzlar GmbH. Apparatus for compensating for the rebounding of an automatic diaphragm in a photographic objective. 4,411,510., Cl. 354-272.000.

Fairchild Camera & Instrument Corp.: *See*—
Mor, Yeshayahu; and Wilnai, Dan, 4,412,283., Cl. 364-200.000.

Faivre, Eric. Stringed musical instrument having soundboard. 4,411,186., Cl. 84-291.000.

Falk Corporation, The: *See*—
Bednar, Thomas R., 4,411,347., Cl. 192-88.00B.
Witt, Ronald A., 4,411,346., Cl. 192-85.00A.

Fano, Maurizio: *See*—
Bernareggi, Virgilio; Margutti, Roberto; Bonifacio, Fausto; and Fano, Maurizio, 4,411,902., Cl. 424-265.000.

Farmanian, Paul A.: *See*—
Yen, Teh F.; and Farmanian, Paul A., 4,411,816., Cl. 252-356.000.

Farmer, Ian W., to Arken, Inc. Slit-tube sign stand. 4,411,085., Cl. 40-610.000.

Farmitalia Carlo Erba, S.p.A.: *See*—
Cassinelli, Giuseppe; Grein, Arpad; Merli, Sergio; and Rivola, Giovanni, 4,411,834., Cl. 260-365.000.

Farrington, Jeffrey G.: *See*—
Chown, Martin; and Farrington, Jeffrey G., 4,411,526., Cl. 356-350.000.

Fassbender, Heinrich: *See*—
Kramer, Horst; and Fassbender, Heinrich, 4,412,176., Cl. 324-204.000.

Feathers, William D., to Du Pont de Nemours, E. I., and Company. Removable contoured insert for an extrusion die. 4,411,614., Cl. 425-466.000.

Feichtinger, Gerhard, to List, Hans. Internal combustion engine. 4,411,227., Cl. 123-196.00R.

Feinland, Seymour; and Rubinstein, Arthur, to Pitney Bowes Inc. Method for tracking creep and drift in a digital scale under full load. 4,412,298., Cl. 364-567.000.

Fenoglio, Bernard F. Process for baking pies. 4,411,920., Cl. 426-233.000.

Fenwick, Loel. Maternity care bed. 4,411,035., Cl. 5-68.000.

Ferix Corporation: *See*—
Springer, Gilbert D., 4,411,512., Cl. 355-3.0TR.

Ferrage, Francois, to Dubix. Laundry ironing device with pivoted blade folder. 4,411,082., Cl. 38-9.000.

Fetheroff, Charles W.: *See*—
Derkacs, Thomas; Fetheroff, Charles W.; Matay, Istvan M.; and Toth, Istvan J., 4,411,940., Cl. 428-73.000.

Feuerbaum, Hans P.; and Tobolka, Gerald, to Siemens Aktiengesellschaft. Method and arrangement for quantitative potential measurements on surface-wave filters. 4,412,191., Cl. 333-193.000.

Feuerherd, Karl-Heinz: *See*—
Koenig, Karl-Heinz; and Feuerherd, Karl-Heinz, 4,411,752., Cl. 204-158.0HA.

Feutrel, Claude: *See*—
Leclercq, Joseph; Le Pargneux, Jacques; Feutrel, Claude; Lestiboudois, Guy; and Chantant, Michel, 4,411,862., Cl. 376-442.000.

Fiala, Ernest, to Volkswagenwerk Aktiengesellschaft. Vehicle drive. 4,411,171., Cl. 74-675.000.

Fiber Industries, Inc.: *See*—
Bromley, James E.; and Dees, John R., 4,411,852., Cl. 264-171.000.

Fiebig, August E., Jr.; Shurney, Glenn A.; and Nagy, Anton J., to Alberto-Culver Company. Method for making perfume-release plastic decorations. 4,411,855., Cl. 264-219.000.

Field, Thomas R.; and Simon, Donald J., to Jenn-Air Corporation, The. Countertop range with proximity ventilation and electronic air cleaner. 4,411,254., Cl. 126-300.000.

Fillion, Pierre, to Somfy. Control device for electric motor-reducing unit. 4,411,348., Cl. 192-139.000.

Fine, Howard: *See*—
Caslavsky, Vera B.; Gron, Poul; and Fine, Howard, 4,411,889., Cl. 424-151.000.

Finlayson, Claude M.; and Mardis, Wilbur S., to NL Industries, Inc. Organophilic clay complexes, their preparation and compositions comprising said complexes. 4,412,018., Cl. 523-508.000.

Finney, Roy P., to Medical Engineering Corporation. Semi-rigid penile implant. 4,411,261., Cl. 128-79.000.

Fioriti, Joseph A.: *See*—
Trumbetas, Jerome F.; Sims, Rex; and Fioriti, Joseph A., 4,411,926., Cl. 426-565.000.

Firmenich SA: *See*—
Schulte-Elte, Karl H.; and Kastner, Dietrich, 4,411,829., Cl. 252-522.00R.

Fischer, Carlin P., to Technicraft, Inc. Oil well sucker rod shear tool. 4,411,546., Cl. 403-23.000.

Fishter, Robert E.; and Lada, Henry, to United Technologies Corporation. Selective chemical milling of recast surfaces. 4,411,730., Cl. 156-626.000.

Fitzgerald-Smith, James P., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britan-

nic Majesty's Government of the. Transportable bridge. 4,411,036., Cl. 14-2.400.
Flaningam, Ora L.; and Halm, Roland L., to Dow Corning Corporation. Separation of chlorosilanes by extractive distillation. 4,411,740., Cl. 203-58.000.
Fleckenstein, Elwin H.; and Welsch, Walter N., to Dynabrade, Inc. Miniature belt grinder. 4,411,106., Cl. 51-170.0EB.
Fleming, Philip J. Solar collector. 4,411,256., Cl. 126-441.000.
Flexnit Company, Inc.: *See*—
Weintraub, Ronald, 4,411,269., Cl. 128-482.000.
Flournoy, Norman E., to Texaco Inc. Acoustic pulse-echo wall thickness method and apparatus. 4,412,315., Cl. 367-99.000.
Floyd, Terry S.; Rhoden, Donna G.; and Bradley, Walter E., to Celanese Corporation. Ventilated thermoplastic polymer foam filter rods. 4,411,280., Cl. 131-332.000.
Flynn, William M., to Gametree Company, The. Board game apparatus. 4,411,433., Cl. 273-260.000.
Fogarty, A. Edward: *See*—
Fogarty, Bonnie R.; Fogarty, A. Edward; Nowak, Ralph; and Lovewell, Jack S., 4,411,249., Cl. 124-64.000.
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Takaya, Takao; and Murata, Masayoshi, 4,411,898., Cl. 424-246.000.
Ueda, Ikuo; Morino, Daizou; and Takimoto, Koichi, 4,411,900., Cl. 424-250.000.
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Nomura, Yoshiyuki; and Okuda, Kanemasa, 4,412,118., Cl. 219-69.00W.
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Kikuchi, Hideo; Baba, Shigenori; and Sato, Shoji, 4,412,240., Cl. 357-45.000.
Komeno, Junji, 4,411,729., Cl. 156-612.000.
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Funkhouser, Berland M. Wall protector and heat circulator. 4,411,252., Cl. 126-201.000.
Furlette, James L.; and Stadler, Donald A., to Excel Corporation. Automatic accumulating transfer mechanism. 4,411,355., Cl. 198-718.000.
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Furuta, Haruo: *See*—
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Wusthof, Peter; and Schneider, Johann, 4,411,607., Cl. 418-61.00B.
Gabrielsen, Rolf S., to Eastman Kodak Company. Dye precursors and their use in photographic materials and processes. 4,411,984., Cl. 430-351.000.
Gailey, J. Lynn; and Wollam, Carl A., to Alcan Aluminum Corporation. Apparatus for producing striped surface coatings. 4,411,215., Cl. 118-111.000.
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Wollam, Carl A.; Gailey, J. Lynn; and Chalmers, Alexander F., 4,411,218., Cl. 118-411.000.
Gain, Lorand H., Jr., to AMSTED Industries Incorporated. Valve position indicator with variable indicator plates. 4,411,288., Cl. 137-363.000.
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Galeano, Sergio F., to Owens-Illinois, Inc. Pulp treating process. 4,411,737., Cl. 162-7.000.
Galeski, Andrzej; Kalinski, Ryszard; and Kryszewski, Marian, to Polska Akademia Nauk. Process for improvement of adhesion between mineral fillers and thermoplastic polymers. 4,411,704., Cl. 106-308.00Q.
Galindo, Anibal. Hypodermic needle. 4,411,657., Cl. 604-274.000.
Gallman, Joseph L., to Loose Leaf Metals Company, Inc. Post binder ball lock assembly. 4,411,544., Cl. 402-69.000.
Gamboa, Paul, to Motorola, Inc. Protection circuit for a horizontal scanning circuit and CRT. 4,412,157., Cl. 315-387.000.
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Lehmann, Hans-Dieter; Krisam, Gerd G.; and Golla, Ruth S., 4,412,000., Cl. 435-179.000.
Gamertsfelder, George R.; and Ljung, Bo Hans G., to Singer Company, The. Ring laser gyroscope with compensation. 4,411,527., Cl. 356-350.000.
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Flynn, William M., 4,411,433., Cl. 273-260.000.
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Meserol, Peter M.; and Acker, Jesse L., 4,411,518., Cl. 356-39.000.
Gammill, Ronald B., to Upjohn Company, The. Antiatherosclerotic compositions. 4,412,071., Cl. 544-58.600.
Ganguly, Ashit K.: *See*—
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Garcia, Barbara A.: *See*—
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Gardineer, Bayard G., Jr.; and Howlett, Charles W., to Technicare Corporation. Storage and record system for a large number of associated images. 4,411,360., Cl. 206-313.000.
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Korsh, George J.; Holler, Mark A.; Perlegos, George; and Gargini, Paolo, 4,412,310., Cl. 365-185.000.
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Gaske, Joseph E.; Plaisance, Thomas H.; and Sekmakas, Kazys, to DeSoto, Inc. Siliconized polyether thermosetting coating compositions. 4,412,032., Cl. 524-538.000.
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Steinhagen, Thomas C., 4,411,934., Cl. 427-242.000.
Gauchel, Peter; and Kurth, Josef, to Dynamit Nobel Aktiengesellschaft. Apparatus for the vacuum calibration of profiled articles made of a thermoplastic synthetic resin. 4,411,613., Cl. 425-388.000.
Gausepohl, Hermann: *See*—
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Gauthier, Jean: *See*—
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Gautier, Raoul L. A., to Societe Generale des Eaux Minerales de Vittel. Packaging apparatus. 4,411,123., Cl. 53-550.000.
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Gee, Minor E., to Maxco Supply, Inc. Carton-erecting machine. 4,411,642., Cl. 493-125.000.
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Wedertz, Larry D.; Ross, Oakley G.; and Niemeier, Byron M., 4,411,398., Cl. 244-3.280.
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Aftergut, Siegfried; and Cole, Herbert S., 4,411,812., Cl. 252-299.100.
Hazra, Jayanta; and Haque, Sazzadul, 4,411,565., Cl. 407-114.000.
Lee, Minyoung; Reed, William R., Jr.; and Szala, Lawrence E., 4,411,566., Cl. 407-119.000.
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Ragonese, Louis J.; Schmitz, Nicholas A.; Bevacqua, Saverio F.; and Owyang, King, 4,412,142., Cl. 307-477.000.
Rickard, Jimmy R.; and Hollenbeck, Robert K., 4,411,664., Cl. 8-158.000.
Rosenquist, Niles R., 4,412,060., Cl. 528-196.000.
Waldron, Wesley K., 4,411,633., Cl. 445-24.000.
Williams, Robert E., 4,412,081., Cl. 556-460.000.
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Trumbetas, Jerome F.; Sims, Rex; and Fioriti, Joseph A., 4,411,926., Cl. 426-565.000.
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Gersho, Allen; Ho, Edmond Y.; Gitlin, Richard D.; Lawrence, Victor B.; and Lim, Tong L., to Bell Telephone Laboratories, Incorporated. Interference cancellation method and apparatus. 4,412,341., Cl. 375-102.000.
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Reutler, Herbert; Muller-Frank, Ulrich; Ullrich, Manfred; and Schepers, Hubert, 4,411,860., Cl. 376-338.000.
Gibson, Kenneth L., to Zenith Radio Corporation. Means for attaching television receiver cabinet back panels. 4,411,480., Cl. 312-7.200.
Gies, Thomas E.: *See*—
Keith, Jack L.; and Gies, Thomas E., 4,411,219., Cl. 118-505.000.
Gieswein, Jimmie T., to Cameron Iron Works, Inc. Flowline connector. 4,411,317., Cl. 166-347.000.
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Trotta, Robert A., 4,411,065., Cl. 30-47.000.
Gilligan, William H.; and Stafford, Scott L., to United States of America, Navy. Halo, nitro, and halonitro S-alkyl thiocarbonates. 4,411,837., Cl. 260-455.00B.
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Gillis, Steven, to Immunex Corporation. Process for preparing murine interleukin 2. 4,411,992., Cl. 435-68.000.

Gillis, Steven. Hybridoma antibody which inhibits interleukin 2 activity. 4,411,993., Cl. 435-68.000.

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Girijavallabhan, Viyyoor M.; McCombie, Stuart W.; and Ganguly, Ashit K., to Schering Corporation. (5R,6S,8R)-6-(1-Hydroxyethyl)-2-(2-fluoroethylthio)-penem-3-carboxylates. 4,411,906., Cl. 424-270.000.

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Gersho, Allen; Ho, Edmond Y.; Gitlin, Richard D.; Lawrence, Victor B.; and Lim, Tong L., 4,412,341., Cl. 375-102.000.

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Goetz, Carl A.: *See*—
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Goldberg, Paul R., to Wavetek Indiana, Inc. Apparatus and method for producing images on a photosensitive media. 4,412,230., Cl. 346-110.00R.

Golden, Neil S., to Allen, Albert H., a part interest. Sealing strip for an expansion void. 4,411,112., Cl. 52-288.000.

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Lehmann, Hans-Dieter; Krisam, Gerd G.; and Golla, Ruth S., 4,412,000., Cl. 435-179.000.

Golub, Gregory J., to Westinghouse Electric Corp. Circuit breaker with unitary actuating shaft. 4,412,116., Cl. 200-155.00R.

Gonella, Jacques, to Refarmed, Recherches Pharmaceutiques et Medicales, S.A. [(2-Oxo-3-tetrahydrothienylcarbamoyl)-alkylthio] acetic acids, their salts and esters, a process for preparation thereof and the pharmaceutical compositions containing same. 4,411,909., Cl. 424-275.000.

Goodman System Company, Inc., The: *See*—
Goodman, Toronta P., 4,411,224., Cl. 123-25.00A.

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Goodyear Aerospace Corporation: *See*—
Uram, John R., Jr., 4,412,046., Cl. 525-506.000.
Uram, John R., Jr., 4,412,052., Cl. 528-27.000.

Gordin, Stefan: *See*—
Makinen, Eero; and Gordin, Stefan, 4,411,631., Cl. 440-72.000.

Goshi, Noriaki: *See*—
Fujita, Osamu; Goshi, Noriaki; Okayasu, Shinya; Shimizu, Motoharu; and Kakinuma, Nobuo, 4,412,104., Cl. 179-117.000.

Goto, Hiroki: *See*—
Nakashima, Hiroyuki; Sumida, Morihiro; and Goto, Hiroki, 4,411,696., Cl. 75-51.000.

Goto, Masao, to Sony Corporation. Device for detecting interband gaps on record medium. 4,412,318., Cl. 369-41.000.

Goto, Masao: *See*—
Tokumitsu, Shunji; Urushibata, Hiroyuki; and Goto, Masao, 4,412,321., Cl. 369-233.000.

Gotoh, Akira; Obayashi, Hidehito; Nagai, Ryo; Mochizuki, Shouji; and Kudo, Tetsuichi, to Hitachi Maxell, Ltd. Lithium compounds. 4,411,971., Cl. 429-191.000.

Grabenhorst, Rolf: *See*—
Hubner, Rudolf; and Grabenhorst, Rolf, 4,411,483., Cl. 339-17.00M.

Graber Industries, Inc.: *See*—
Volfson, Boris, 4,411,044., Cl. 16-219.000.

Grafenschnell, Horst: *See*—
Voss, Erich; and Grafenschnell, Horst, 4,412,145., Cl. 310-154.000.

Grafwallner, Karl L.: *See*—
Herold, Wolf-Dietrich; Grafwallner, Karl L.; and Keller, Michael, 4,412,134., Cl. 250-504.00R.

Grain Processing Corporation: *See*—
Pedersen, Lee C.; and Elmquist, Lyle F., 4,412,036., Cl. 525-54.260.

Gratzfeld, Edward P. Material spreader and bridge. 4,411,554., Cl. 404-110.000.

Gravel, Real. Solder feeding gun and attachment. 4,411,379., Cl. 228-52.000.

Great Lakes Carbon Corporation: *See*—
Harvey, Jay A., 4,411,748., Cl. 204-70.000.

Green, Dan; and Goldner, Sandor, to Cynex Manufacturing Corporation. Polyphase power factor controller. 4,412,167., Cl. 318-729.000.

Green, Edward A. T., to Devro, Inc. End closure for sausage casings. 4,411,048., Cl. 17-49.000.

Green, Laddie L.; and Matsumoto, Kent E., to Stauffer Chemical Company. Dihalopropyl ester antidotes for acetanilide herbicides. 4,411,686., Cl. 71-88.000.

Green, Peter C.; and Block, Jacob, to W. R. Grace & Co. High temperature stable fluid loss control system. 4,411,800., Cl. 252-8.50A.

Greenwood, Arthur R.: *See*—
Kroushl, Joseph A.; and Greenwood, Arthur R., 4,411,869., Cl. 422-188.000.
Kroushl, Joseph A.; and Greenwood, Arthur R., 4,411,870., Cl. 422-188.000.

Grein, Arpad: *See*—
Cassinelli, Giuseppe; Grein, Arpad; Merli, Sergio; and Rivola, Giovanni, 4,411,834., Cl. 260-365.000.

Griffin, Ernest E.: *See*—
Lowry, Joseph M.; and Griffin, Ernest E., 4,411,126., Cl. 56-17.500.

Grimm, Dieter, to Degussa Aktiengesellschaft. Electrical thermometer for measuring surface temperature (I). 4,411,537., Cl. 374-185.000.

Grimmer, Paul D.: *See*—
Breglia, Denis R.; Oharek, Frank J.; and Grimmer, Paul D., 4,411,627., Cl. 434-44.000.

Grindler, Horst: *See*—
Schutt, Peter; Bernhardt, Martin; Nitsche, Klaus; Grindler, Horst; and Hofmann, Hans-Joachim, 4,411,550., Cl. 403-358.000.

Grol, Hermanus: *See*—
van Gogh, Johan; and Grol, Hermanus, 4,412,056., Cl. 528-112.000.

Gron, Poul: *See*—
Caslavsky, Vera B.; Gron, Poul; and Fine, Howard, 4,411,889., Cl. 424-151.000.

Grone, Robert J.; and Schnell, Leonard R., to Cincinnati Milacron Industries, Inc. Ejection means for removing a hollow article from machine in which the article is made. 4,411,579., Cl. 414-417.000.

Gross, Benjamin, to Mobil Oil Corporation. Heat balance in FCC process and apparatus with downflow reactor riser. 4,411,773., Cl. 208-164.000.

Grow, Ann E., to Midwest Research Institute. Processes and devices for detection of substances such as enzyme inhibitors. 4,411,989., Cl. 435-20.000.

Gruber, Bruce A.; Koch, Diether; Langer, Heimo J.; and Dunnavant, William R., to Ashland Oil, Inc. Cyclopentadiene derivatives, method for preparing, and use thereof. 4,412,088., Cl. 585-23.000.

Gruber, Gunther: *See*—
Kriegner, Othmar; and Gruber, Gunther, 4,411,534., Cl. 374-141.000.

Grundfest, Michael A., to Thomas & Betts Corporation. Splice installing tool. 4,411,063., Cl. 29-751.000.

Gruppo Lepetit, S.p.A.: *See*—
Toia, Emilio, 4,411,907., Cl. 424-273.00B.

GTE Automatic Electric Labs Inc.: *See*—
Holden, James R., 4,412,282., Cl. 364-200.000.
Khan, Ashfaq R.; and Edwards, Ivan L., 4,412,342., Cl. 375-107.000.
Koppensteiner, James V.; and Onesto, Joseph B., 4,411,064., Cl. 29-764.000.

GTE Products Corporation: *See*—
Barakitis, Nikolaos; and Cohen, Sheppard, 4,412,152., Cl. 315-73.000.
Kwok, Sai W., 4,412,245., Cl. 358-86.000.
Mizuhara, Howard, 4,411,960., Cl. 428-610.000.
Strubeck, W. Douglas, 4,412,301., Cl. 364-728.000.

Guerriero, Renato; and Vittadini, Italo, to SAMIM Societa Azionaria Minero Metallurgica S.p.A. Electrolytic cells. 4,411,760., Cl. 204-270.000.

Guilden Development Corp.: *See*—
Von Kemenczky, Miklos, 4,412,205., Cl. 340-331.000.

Gulbrandsen, Arthur F.; and Oko, Uriel M., to Cities Service Company. Apparatus for converting coal. 4,411,871., Cl. 422-232.000.

Gulf Research & Development Company: *See*—
Pretzer, Wayne R.; and Pannell, Richard B., 4,411,820., Cl. 502-167.000.

Gustavsson, Olle, to Aktiebolaget Bofors. Device for speed control of cylinder piston, particularly useful for a firearm. 4,411,188., Cl. 89-20.00A.

Gutekunst, Robert W.: *See*—
Poppe, Wassily; Craddock, Charles F.; Gutekunst, Robert W.; Ladd, Robert G.; and Mager, Sue A., 4,411,610., Cl. 425-174.400.

Gutierrez, Antonio; Brois, Stanley J.; Ryer, Jack; and Deen, Harold E., to Exxon Research & Engineering Co. Multifunctional additive for power transmission shift fluids. 4,411,808., Cl. 252-78.100.

GX-Holding AG: *See*—
Jaeger, Walter, 4,412,243., Cl. 358-334.000.

H. B. Fuller Company: *See*—
LaBelle, Stanley B.; and Hagquist, James A. E., 4,412,033., Cl. 524-590.000.

H. J. Weir Engineering Co., Ltd.: *See*—
Weir, Henry J., 4,411,083., Cl. 38-143.000.

Hachiya, Susumu: *See*—
Kawate, Yoshio; Nagai, Nobuyuki; Horiuchi, Takefumi; Uehara, Terushisa; and Hachiya, Susumu, 4,412,090., Cl. 136-230.000.

Hackwood, Susan: *See*—
Beni, Gerardo; Craighead, Harold G.; and Hackwood, Susan, 4,411,495., Cl. 350-347.00V.

HAG Aktiengesellschaft: *See*—
Hubert, Peter; and Vitzthum, Otto, 4,411,923., Cl. 426-271.000.

Hageman, Hendrik J.; Giezen, Egenius A.; and Jansen, Leonardus G. J., to Akzo N.V. Initiator system for radiation curable compositions, radiation curable compositions containing such an initiator system, a process for curing said compositions and products covered therewith. 4,411,822., Cl. 502-168.000.

Hageman, Hendrik J.; de Klein, Willem J.; and Giezen, Egenius A., to Akzo N.V. Initiator system for radiation curable compositions, radiation curable compositions containing such an initiator system, a process for curing said compositions and products covered therewith. 4,411,823., Cl. 502-168.000.

Hagquist, James A. E.: *See*—
LaBelle, Stanley B.; and Hagquist, James A. E., 4,412,033., Cl. 524-590.000.

Haight, Robert E.; and Tjepkes, Kendall D., to Deere & Company. Clutch modulating system. 4,411,345., Cl. 192-12.00C.

Haissig, Bruce E.: *See*—
Boyles, David A.; Gaines, Jack R.; and Haissig, Bruce E., 4,411,684., Cl. 71-77.000.

Haldeman, Peter P.: *See*—
Diederich, Anthony F., Jr.; Haldeman, Peter P.; and Campbell, Willis R., 4,411,127., Cl. 56-364.000.

Hale, James V. M.: *See*—
Sedam, Jason K.; Hale, James V. M.; Caldwell, Stewart W.; Bushman, Willard T.; and Wright, Richard A., 4,412,292., Cl. 364-479.000.

Halgrimson, Darrell N.; Hanson, Donald H.; and King, Richard T., to Black Clawson, Inc.; and Black Clawson, Inc. Ultrasonic log scanning and orientation system. 4,412,297., Cl. 364-559.000.

Hall, Floyd V., to Liggett Group Inc. Apparatus for the production of cigarette filter tips having multi-sectional construction. 4,411,640., Cl. 493-45.000.

Hallmark Camera Mfg. Pte. Ltd.: *See*—
Yang, Lian T., 4,411,506., Cl. 354-145.000.

Halm, Roland L.: *See*—
Flaningam, Ora L.; and Halm, Roland L., 4,411,740., Cl. 203-58.000.

Halstead, Raymond T.: *See*—
Schaad, William J.; Black, Charles E., III; and Halstead, Raymond T., 4,412,109., Cl. 200-16.00C.

Hamakawa, Toshihiro: *See*—
Fujii, Setsuro; Hamakawa, Toshihiro; Ogawa, Kazuo; Muranaka, Yoshiyuki; and Hashimoto, Sadao, 4,411,911., Cl. 424-283.000.

Hamamatsu Systems, Inc.: *See*—
Allen, Robert D.; and Allen, Nina S., 4,412,246., Cl. 358-107.000.

Hamano, Toshihisa, to Fuji Xerox Co., Ltd. Thermal head. 4,412,227., Cl. 346-76.0PH.

Hamburger, Anne W.: *See*—
Salmon, Sydney E.; and Hamburger, Anne W., 4,411,990., Cl. 435-32.000.

Hamilton, Martin W., to Eaton Corporation. Load bar mounting assembly. 4,411,325., Cl. 177-136.000.

Hamilton, Thomas B., to Combustion Engineering, Inc. Method of firing a pulverized fuel-fired steam generator. 4,411,204., Cl. 110-347.000.

Hammelmann, Robert W., to Bendix Corporation, The. Flexible coupling having molded plastic flexible diaphragms. 4,411,634., Cl. 464-91.000.

Hanada, Hidekazu, to Nihon Plast Co., Ltd. Automotive steering column cover. 4,411,331., Cl. 180-78.000.

Haney, Douglas M.; and Lott, John W., to Du Pont de Nemours, E. I., and Company. Process for the preparation of flexible circuits. 4,411,980., Cl. 430-291.000.

Hannebaum, Heinz: *See*—
Degner, Dieter; Roos, Hans; and Hannebaum, Heinz, 4,411,746., Cl. 204-59.00R.

Hans Grohe GmbH & Co. KG, Firma: *See*—
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Hansell, George A., III, to W. L. Gore & Associates, Inc. Multiconductor coaxial cable assembly and method of fabrication. 4,412,092., Cl. 174-36.000.

Hansen, Gorm P. Jaw hinge-axis locator. 4,411,622., Cl. 433-73.000.

Hansen, Hanspeter: *See*—
Rohr, Wolfgang; Hansen, Hanspeter; Wuerzer, Bruno; and Ceser, Heinz-Guenter, 4,411,691., Cl. 71-92.000.

Hansen, James E.; and Smith, Richard G., to Eaton Corporation. Dual voltage engine starter management system. 4,412,137., Cl. 307-10.00R.

Hansen, James E., to Eaton Corporation. Time-delay current sensing circuit breaker relay. 4,412,267., Cl. 361-94.000.

Hanson, Donald H.: *See*—
Halgrimson, Darrell N.; Hanson, Donald H.; and King, Richard T., 4,412,297., Cl. 364-559.000.

Hapke, Donald W., to Boeing Company, The. Retractable nozzle fairing system for aeroplane center boost engine. 4,411,399., Cl. 244-130.000.

Haque, Sazzadul: *See*—
Hazra, Jayanta; and Haque, Sazzadul, 4,411,565., Cl. 407-114.000.

Hara, Akira, to Mitsubishi Denki Kabushiki Kaisha. Parallel operation compressor type refrigerating apparatus. 4,411,141., Cl. 62-468.000.

Hara, Tomihiro; Ogawa, Masahiro; Tsukada, Masakazu; and Yamashita, Masaaki, to Nippon Kokan Kabushiki Kaisha. Composite coating steel sheets having good corrosion resistance paintability and corrosion resistance after paint coating. 4,411,964., Cl. 428-626.000.

Harada, Fumio: *See*—
Itagaki, Masato; Harada, Fumio; and Arata, Tetsuya, 4,411,600., Cl. 417-312.000.

Harada, Hiroshi: *See*—
Sato, Shinichi; Harada, Hiroshi; Fukumoto, Takaaki; Takano, Hirozo; Kotani, Hideo; and Kayano, Shinpei, 4,411,929., Cl. 427-38.000.

Hardenberg, Horst; and Bergmann, Horst, to Daimler-Benz AG. Externally operated internal combustion engine. 4,411,243., Cl. 123-577.000.

Harman, John N., III; and Jones, Robert H., to Beckman Instruments, Inc. Hydrogen ion interferent reduction system for ion selective electrodes. 4,411,764., Cl. 204-411.000.

Harnisch, Horst, to Bayer Aktiengesellschaft. Impregnating paper with 7-hydroxy-coumarin compounds. 4,411,946., Cl. 428-219.000.

Harris Corporation: *See*—
Bailey, David C.; and Klein, Robert E., 4,411,503., Cl. 352-222.000.
Yochum, Billy G., 4,412,182., Cl. 330-59.000.

Harris, Robert J.: *See*—
Jones, Bradley N.; Harris, Robert J.; Cram, Ronald P.; and Huber, Gene A., 4,411,673., Cl. 55-41.000.

Harrison, John D., to Shell Internationale Research Maatscappij, B. A. Filler gun suitable for cavity injection. 4,411,389., Cl. 239-427.500.

Hart, Cullen P., to Caterpillar Tractor Co. Vehicle suspension system. 4,411,447., Cl. 280-714.000.

Hartke, David H.: *See*—
Neches, Philip M.; Hartke, David H.; Stockton, Richard C.; Watson, Martin C.; Cronshaw, David; and Shemer, Jack E., 4,412,285., Cl. 364-200.000.

Hartl, Carroll P.: *See*—
Cornish, Darrel G.; and Hartl, Carroll P., 4,411,122., Cl. 53-436.000.

Hartmann, Kurt: *See*—
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Harvey, Jay A., to Great Lakes Carbon Corporation. Anode and process for magnesium production. 4,411,748., Cl. 204-70.000.

Hasegawa, Hiroaki: *See*—
Kitahara, Shizuo; Hirokawa, Yoshitsugu; Kawada, Haruki; Fujii, Toshihiro; Sugi, Nagatoshi; Hasegawa, Hiroaki; and Yoshioka, Akira, 4,412,031., Cl. 524-526.000.
Kitahara, Shizuo; Hirokawa, Yoshitsugu; Kawada, Haruki; Fujii, Toshihiro; Sugi, Nagatoshi; Hasegawa, Hiroaki; and Yoshioka, Akira, 4,412,041., Cl. 525-154.000.

Hasegawa, Takashi: *See*—
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Hashimoto, Junichi; and Miyagi, Tadayuki, to Pentel Kabushiki Kaisha. Self-feeding mechanical pencil. 4,411,543., Cl. 401-53.000.

Hashimoto, Michiaki: *See*—
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Hashimoto, Sadao: *See*—
Fujii, Setsuro; Hamakawa, Toshihiro; Ogawa, Kazuo; Muranaka, Yoshiyuki; and Hashimoto, Sadao, 4,411,911., Cl. 424-283.000.

Hashimoto, Shintaro: *See*—
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Hashizume, Shuhei; Abeta, Sadaharu; Ohmae, Tadayuki; and Nishibara, Hajime, to Sumitomo Chemical Company, Limited. Process for dyeing polyolefin fiber materials. 4,411,666., Cl. 8-455.000.

Hass, Phyllis W.: *See*—
Hass, Richard M., 4,411,320., Cl. 172-13.000.

Hass, Richard M., to Hass, Phyllis W. Edging tool. 4,411,320., Cl. 172-13.000.

Hassel, Helmut; and Stark, Reimund, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Railway car diaphragm construction. 4,411,201., Cl. 105-8.00R.

Hasuike, Fumio: *See*—
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Hatachi, Ltd.: *See*—
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Hatch, Marcus R.: *See*—
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Hatzikelis, Christopher: *See*—
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Haulamatic Corporation: *See*—
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Hawkins, James A.: *See*—
Hawkins, Robert D.; and Hawkins, James A., 4,411,939., Cl. 428-58.000.
Hawkins, Robert D.; and Hawkins, James A., to National Research Development Corporation. Conformable reinforcement board. 4,411,939., Cl. 428-58.000.
Hayashi, Akira: *See*—
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Hayes, J. Brian, to Kendall Company, The. Protective glove. 4,411,024., Cl. 2-20.000.
Hazra, Jayanta; and Haque, Sazzadul, to General Electric Company. Finishing insert with improved chip control. 4,411,565., Cl. 407-114.000.
Heath, Warren A., to Chevron Research Company. Bottom loading arm for bulk liquid carriers. 4,411,290., Cl. 137-615.000.
Hechenbleikner, Ingenuin; and Enlow, William P., to Borg-Warner Chemicals, Inc. Oxidation of alkyl phosphonous dichlorides. 4,411,842., Cl. 260-543.00P.
Heck, Gunter: *See*—
Ulrich, Michael; Trautmann, Manfred; Heck, Gunter; and Malow, Egon, 4,411,846., Cl. 261-98.000.
Hedstrom, Dennis G.; and Hedstrom, Rocky O. Animal trap with support-suspension legs. 4,411,091., Cl. 43-88.000.
Hedstrom, Rocky O.: *See*—
Hedstrom, Dennis G.; and Hedstrom, Rocky O., 4,411,091., Cl. 43-88.000.
Hefner, Robert E., Jr., to Dow Chemical Company, The. Epoxy resins prepared from epihalohydrins and hydroxyl-containing phosphonopolyester oligomers. 4,412,055., Cl. 528-99.000.
Heimberger, Halmut, to Optilon W. Erich Heilmann GmbH. Method of and apparatus for attaching slide fastener coupling chains to a flexible support. 4,411,211., Cl. 112-265.200.
Heimburger, Norbert: *See*—
Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Drescher, Heinz H., 4,411,794., Cl. 210-670.000.
Heiney, Elmer T., III: *See*—
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Heinzl, Joachim; and von Borstel, Klaus P., to Siemens Aktiengesellschaft. Method and apparatus for the representation of gray scale values in facsimile transmission. 4,412,256., Cl. 358-283.000.
Heissler, Herbert: *See*—
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Heitz, Walter; Kress, Hans-Jurgen; and Stix, Wolfgang, to Bayer Aktiengesellschaft. Polytetrahydrofurans containing terminal acrylate or methacrylate groups. 4,412,063., Cl. 528-409.000.
Helbig, Peter; Schonherr, Walter; and Steiner, Hermann, to Patent-Treuhand-Gesellschaft fur Elektrische Gluhlampen mbH. Halogen incandescent lamp with part metal, part plastic socket, particularly for automotive headlights. 4,412,273., Cl. 362-211.000.
Helle, Jacques; and Caret, Guy, to Compagnie d'Electronique et de Piezo-Electricite C.E.P.E. Temperature-compensated crystal oscillator. 4,412,188., Cl. 331-176.000.
Henderson, Martin E.: *See*—
Lautzenheiser, William J.; Simonetti, Richard A.; Henderson, Martin E.; Edson, James B.; and Beeson, Kenneth E., 4,412,211., Cl. 340-514.000.
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Hendrickson, Max S., to Honeywell Inc. Frequency shift keyed detector system. 4,412,338., Cl. 375-82.000.
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Klein, Kenneth; Bator, Patricia E.; and Pact, Harry H., 4,412,027., Cl. 524-364.000.
Henrick, Clive A.; and Garcia, Barbara A., to Zoecon Corporation. Insecticidal isovaleric acid esters. 4,411,912., Cl. 424-304.000.
Henrick, Clive A.: *See*—
Lindahl, George R., III; and Henrick, Clive A., 4,411,839., Cl. 260-465.00D.
Herman, Irving P.; and Marling, Jack B. Laser-assisted isotope separation of tritium. 4,411,755., Cl. 204-163.00R.
Herman, Michael. Experiment-machine. 4,412,288., Cl. 364-413.000.
Herman, Thomas; and Lidow, Alexander, to International Rectifier Corporation. Planar structure for high voltage semiconductor devices with gaps in glassy layer over high field regions. 4,412,242., Cl. 357-52.000.
Herold, Wolf-Dietrich; Grafwallner, Karl L.; and Keller, Michael, to ESPE Fabrik Pharmazeutischer Praeparate GmbH. Apparatus for irradiating dental objects. 4,412,134., Cl. 250-504.00R.
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Hershberger, Vilas D. Therapeutic apparatus. 4,411,421., Cl. 272-73.000.
Hersom, Albert C.; and Wright, Kenneth W., to Societe d'Assistance Technique pour Produits Nestle S.A. Pump for metering two distinct fluids. 4,411,601., Cl. 417-388.000.
Hess, James B.; and Strahl, Erwin O., to Kaiser Aluminum & Chemical Corporation. Electrolytic reduction cell. 4,411,758., Cl. 204-243.00R.
Hess, Klaus: *See*—
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Hess, Max W., to Dahlgren Manufacturing Company. Roller gear drive. 4,411,193., Cl. 101-148.000.
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Walker, Jerry A.; and Hessler, Edward J., 4,411,835., Cl. 260-397.450.
Hesting, Daniel O. Paddle wheel turbine device. 4,411,591., Cl. 415-103.000.
Hewing Manufacturing Corporation: *See*—
English, Donald H., 4,411,312., Cl. 166-75.00R.
Hewlett-Packard Company: *See*—
Watson, Robert E.; Walden, Jack M.; and Near, Charles W., 4,412,300., Cl. 364-709.000.
Hewlett-Packard GmbH: *See*—
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Heyman, Arnold M. Telemetry transmitter holder. 4,411,267., Cl. 128-385.000.
Heynhold, Ingo, to Continental Gummi-Werke Aktiengesellschaft. Conveyor belt. 4,411,947., Cl. 428-250.000.
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Masami, Sato; Okuzawa, Yasutoshi; and Hibino, Noburo, 4,411,958., Cl. 428-457.000.
Higgins, Rudolph S., to Texasgulf Inc. Solution mining of an inclined structure. 4,411,474., Cl. 299-4.000.
Higginson, Richard L., to Berlin & Jones Company, Inc. Double envelope and method of making same. 4,411,643., Cl. 493-188.000.
Hillmann, Willi, to Paul Vahle GmbH & Co. KG. Electrical conductor. 4,412,107., Cl. 191-23.00A.
Hinman, P. Anthony, to Armco Inc. Metal atom containing epoxy resins. 4,412,064., Cl. 528-9.000.
Hiraguri, Seisuke, to Victor Company of Japan, Ltd. Magnetic recording and/or reproducing apparatus having a rotary head tracking control device. 4,412,259., Cl. 360-77.000.
Hirai, Eiichi: *See*—
Saito, Masumi; Hirai, Eiichi; and Endo, Masao, 4,411,701., Cl. 106-87.000.
Hirai, Koji; Shirano, Kenji; and Okamura, Takayuki, to Kuraray Co., Ltd. Polyurethane coating compositions prepared from a polymeric diol, an alicyclic diisocyanate, an alicyclic diamine and either hydrazine or isophthalic acid dihydrazide. 4,412,022., Cl. 524-104.000.
Hirai, Koji: *See*—
Kikuga, Toyoji; and Hirai, Koji, 4,412,045., Cl. 525-501.000.
Hiraishi, Shigetoshi: *See*—
Matsushita, Toshihiko; Morishita, Sadao; Kamimura, Eiko; and Hiraishi, Shigetoshi, 4,411,451., Cl. 282-27.500.
Hirakawa, Kan; Takakuma, Ryoji; Nomura, Koji; Katoh, Masami; and Watanabe, Kiyoshi, to Kanegafuchi Chemical Industry Company, Limited. Process for fermentative production of amino acids. 4,411,991., Cl. 435-42.000.
Hirano, Koichi: *See*—
Takahashi, Kenichi; Hirano, Koichi; and Futamura, Shoji, 4,411,175., Cl. 76-107.00R.
Hiraoka, Shoji: *See*—
Niyada, Katsuyuki; Watanabe, Taisuke; Hiraoka, Shoji; and Morii, Shuji, 4,412,099., Cl. 381-51.000.
Hirasawa, Kotaro: *See*—
Kuzunuki, Soshiro; Hirasawa, Kotaro; Yuminaka, Takeo; and Yoneda, Kanji, 4,411,338., Cl. 187-29.00R.
Hirata, Goichi: *See*—
Samejima, Masayoshi; and Hirata, Goichi, 4,411,933., Cl. 427-213.300.
Hirata, Minoru; and Takeda, Tsutae, to Kabushiki Kaisha Fujikoshi. Double row angular contact ball bearing with one-piece outer ring and one-piece inner ring. 4,411,479., Cl. 308-195.000.
Hirohata, Takashi: *See*—
Nishida, Takao; and Hirohata, Takashi, 4,411,937., Cl. 427-435.000.
Hirokawa, Yoshitsugu: *See*—
Kitahara, Shizuo; Hirokawa, Yoshitsugu; Kawada, Haruki; Fujii, Toshihiro; Sugi, Nagatoshi; Hasegawa, Hiroaki; and Yoshioka, Akira, 4,412,031., Cl. 524-526.000.
Kitahara, Shizuo; Hirokawa, Yoshitsugu; Kawada, Haruki; Fujii, Toshihiro; Sugi, Nagatoshi; Hasegawa, Hiroaki; and Yoshioka, Akira, 4,412,041., Cl. 525-154.000.
Hirose, Akira: *See*—
Ariyama, Kenzo; and Hirose, Akira, 4,411,511., Cl. 355-3.0TR.
Hirose, Kimio: *See*—
Mizutani, Akihiro; and Hirose, Kimio, 4,411,891., Cl. 424-180.000.
Hiscock, Donald C., to Development Finance Corp of New Zealand. Precision sower. 4,411,206., Cl. 111-34.000.
Hishinuma, Toshio: *See*—
Tateyama, Kenichi; Matsumiya, Yasuo; and Hishinuma, Toshio, 4,412,261., Cl. 360-98.000.
Hitachi, Ltd.: *See*—
Atago, Takeshi; and Manaka, Toshio, 4,411,232., Cl. 123-438.000.
Itagaki, Masato; Harada, Fumio; and Arata, Tetsuya, 4,411,600., Cl. 417-312.000.
Katsumata, Naoto; Horiuchi, Noriaki; and Kimura, Shigeru, 4,411,140., Cl. 62-324.200.

Kitada, Masahiro; Suenaga, Masahide; Tsukada, Yukihisa; Shimizu, Noboru; and Yamamoto, Hiroshi, 4,411,757., Cl. 204-192.00E.
Komatsu, Hideo; Iida, Shinya; Mizutani, Tatsumi; and Ueki, Kazuyoshi, 4,412,119., Cl. 219-121.0PF.
Kominami, Yasuo; Sato, Tetsuo; and Ohkubo, Yuichi, 4,412,189., Cl. 333-14.000.
Kuroda, Kunishige, 4,412,195., Cl. 335-216.000.
Kuzunuki, Soshiro; Hirasawa, Kotaro; Yuminaka, Takeo; and Yoneda, Kanji, 4,411,338., Cl. 187-29.00R.
Sasano, Akira; Nakano, Toshio; Tsutsui, Ken; Hashimoto, Michiaki; Kaneko, Tadao; Koike, Norio; and Izumi, Akiya, 4,412,236., Cl. 357-31.000.
Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; Kimura, Takeshi; Kumasaka, Noriyuki; and Fujiwara, Hideo, 4,411,716., Cl. 148-403.000.
Sugiura, Noboru, 4,411,246., Cl. 123-644.000.
Tanaka, Hironari; Ishibashi, Tadashi; and Koyama, Masaharu, 4,412,214., Cl. 340-765.000.
Tateyama, Kenichi; Matsumiya, Yasuo; and Hishinuma, Toshio, 4,412,261., Cl. 360-98.000.
Yamanaka, Kazusuke; and Mochizuki, Shouji, 4,411,497., Cl. 350-357.000.
Yonezawa, Seiji; and Sugiyama, Toshio, 4,411,500., Cl. 350-446.000.
Yoshii, Masaki; Sato, Hidemi; Kaneda, Aizo; Aoki, Masayoshi; Yokono, Hitoshi; and Oka, Mitsunori, 4,411,609., Cl. 425-149.000.

Hitachi Maxell, Ltd.: *See*—
Gotoh, Akira; Obayashi, Hidehito; Nagai, Ryo; Mochizuki, Shouji; and Kudo, Tetsuichi, 4,411,971., Cl. 429-191.000.

Hitachi Metals, Ltd.: *See*—
Fujita, Osamu; Goshi, Noriaki; Okayasu, Shinya; Shimizu, Motoharu; and Kakinuma, Nobuo, 4,412,104., Cl. 179-117.000.
Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; Kimura, Takeshi; Kumasaka, Noriyuki; and Fujiwara, Hideo, 4,411,716., Cl. 148-403.000.

Hjertman, Birger: *See*—
Bennwik, Percy; and Hjertman, Birger, 4,411,358., Cl. 206-45.340.

Ho, Edmond Y.: *See*—
Gersho, Allen; Ho, Edmond Y.; Gitlin, Richard D.; Lawrence, Victor B.; and Lim, Tong L., 4,412,341., Cl. 375-102.000.

Hochtemperatur-Reaktorbau GmbH: *See*—
Koerdt, Reinhold; Schwiers, Hans-Georg; and Schoening, Josef, 4,411,308., Cl. 165-70.000.

Hodge, Malcolm H.: *See*—
Larkin, Joseph F.; and Hodge, Malcolm H., 4,411,491., Cl. 350-96.210.

Hoechst Aktiengesellschaft: *See*—
Dettbarn, Hans-Jurgen; and Zimmermann, Josef, 4,411,650., Cl. 604-72.000.
Kramer, Horst; and Fassbender, Heinrich, 4,412,176., Cl. 324-204.000.
Mondt, Josef; Walz, Gerd; and Wirth, Thaddaus, 4,411,955., Cl. 428-413.000.
Radas, Adolf, 4,411,356., Cl. 198-721.000.
Ulrich, Michael; Trautmann, Manfred; Heck, Gunter; and Malow, Egon, 4,411,846., Cl. 261-98.000.

Hoegerle, Karl; and Ohnemus, Kurt, to Ciba-Geigy Corporation. 2-Alkyl-5-alkyl sulfony 1-4,6-dihalopyrimidines and the production thereof. 4,412,074., Cl. 544-298.000.

Hoelzel, Alexander: *See*—
Schnabel, Roland; Hoelzel, Alexander; and Vaulont, Winfrid, 4,411,781., Cl. 210-195.200.

Hoff, Nikolaus. Telephone organizer. 4,411,482., Cl. 312-233.000.

Hoffman, Joseph A.: *See*—
Loffelman, Frank F.; and Hoffman, Joseph A., 4,412,020., Cl. 524-100.000.

Hoffmann-La Roche Inc.: *See*—
Reiner, Roland, 4,412,070., Cl. 544-27.000.
Schrank, Jurg; and Steffen, Hans, 4,411,894., Cl. 424-199.000.

Hofmann, Hans-Joachim: *See*—
Schutt, Peter; Bernhardt, Martin; Nitsche, Klaus; Grindler, Horst; and Hofmann, Hans-Joachim, 4,411,550., Cl. 403-358.000.

Hogner, Johannes, to Hans Grohe GmbH & Co. KG, Firma. Device for actuating a poppet of a tub drain valve. 4,411,028., Cl. 4-199.000.

Hoke, Donald E.: *See*—
Donaldson, A. Burl; Hoke, Donald E.; and Mulac, Anthony J., 4,411,618., Cl. 431-190.000.

Holden, James R., to GTE Automatic Electric Labs Inc. Microprocessor control circuit. 4,412,282., Cl. 364-200.000.

Holland, Larry D., to NEHA International. Apparatus for recovering precious metals from their ores. 4,411,612., Cl. 425-365.000.

Hollandse Signaalapparaten B.V.: *See*—
Aanstoot, Jan; and Oude Elberink, Bernard H. M., 4,412,220., Cl. 343-55.00C.

Hollenbeck, Robert K.: *See*—
Rickard, Jimmy R.; and Hollenbeck, Robert K., 4,411,664., Cl. 8-158.000.

Holler, Mark A.: *See*—
Korsh, George J.; Holler, Mark A.; Perlegos, George; and Gargini, Paolo, 4,412,310., Cl. 365-185.000.

Hollins, Brian E.: *See*—
Khadder, Wadie N.; Wang, Jia T.; and Hollins, Brian E., 4,412,238., Cl. 357-43.000.

Hollister Incorporated: *See*—
Jensen, Marvin E.; and Mohiuddin, Mahmood, 4,411,659., Cl. 604-332.000.

Holloway, Robert W. Load equalizer. 4,411,444., Cl. 280-405.00A.

Holmes, George; and Keyser, Frank, to Vigil, Thomas R. Extruder assembly. 4,411,531., Cl. 366-76.000.

Holzman, Thomas F.: *See*—
Baldwin, Thomas O.; and Holzman, Thomas F., 4,412,001., Cl. 435-189.000.

Homa, John L., to North American Manufacturing Company, The. Electromechanical device drive circuit fault detection apparatus. 4,412,328., Cl. 371-25.000.

Homecrest Industries Incorporated: *See*—
Apissomian, Arthur A., 4,411,468., Cl. 297-264.000.

Honeywell Inc.: *See*—
Abel, Irving R.; and Hatch, Marcus R., 4,411,499., Cl. 350-442.000.
Hendrickson, Max S., 4,412,338., Cl. 375-82.000.
Hu, Chi P., 4,412,354., Cl. 455-327.000.
Kabat, John L., 4,411,306., Cl. 165-12.000.
Schultz, Earl R., 4,412,262., Cl. 360-109.000.

Hongo, Akira: *See*—
Ito, Tomohisa; and Hongo, Akira, 4,411,799., Cl. 210-753.000.

Hoover Universal, Inc.: *See*—
Lanham, Joseph S.; and Bruckner, Neal R., 4,411,552., Cl. 403-388.000.

Hoper, Jens: *See*—
Kessler, Manfred; and Hoper, Jens, 4,411,151., Cl. 73-1.00G.

Horbaschek, Heinz, to Siemens Aktiengesellschaft. X-Ray diagnostic installation comprising an image intensifier television chain. 4,412,247., Cl. 358-111.000.

Horikawa, Hisao; and Kano, Mitsuru, to Toppan Printing Co., Ltd. Moisture proof container with an outer box and an inner bag opesed simultaneously. 4,411,365., Cl. 206-607.000.

Horiuchi, Hideo: *See*—
Yoshida, Kazutaka; and Horiuchi, Hideo, 4,412,225., Cl. 346-1.100.

Horiuchi, Kotaro, to Yamaha Hatsudoki Kabushiki Kaisha. Rowing scull. 4,411,214., Cl. 114-347.000.

Horiuchi, Noriaki: *See*—
Katsumata, Naoto; Horiuchi, Noriaki; and Kimura, Shigeru, 4,411,140., Cl. 62-324.200.

Horiuchi, Takefumi: *See*—
Kawate, Yoshio; Nagai, Nobuyuki; Horiuchi, Takefumi; Uehara, Teruhisa; and Hachiya, Susumu, 4,412,090., Cl. 136-230.000.

Horninger, Karlheinrich, to Siemens Aktiengesellschaft. Integrated MOS driver stage with a large output signal ratio. 4,412,139., Cl. 307-270.000.

Hoshika, Yoshiaki: *See*—
Nishimura, Shinichi; Akiyama, Yoshinori; and Hoshika, Yoshiaki, 4,411,470., Cl. 297-410.000.

Hoshikawa, Ryusuke: *See*—
Matsumura, Nobutake; Hoshikawa, Ryusuke; Sugiura, Yoshihide; Ichikawa, Hiroaki; and Sato, Syoji, 4,412,237., Cl. 357-42.000.

Hosoe, Kazuya: *See*—
Kinoshita, Takao; Hosoe, Kazuya; and Yamamichi, Masayoshi, 4,411,504., Cl. 354-25.000.
Sakai, Shinji; Shinoda, Nobuhiko; Hosoe, Kazuya; and Kinoshita, Takao, 4,411,505., Cl. 354-25.000.

Hosooka, Shuichi, to Yoshida Kogyo K. K. Window sash assembly. 4,411,111., Cl. 52-213.000.

Hostetler, Dewey, to DewEze Manufacturing, Inc. Bale transfer carrier. 4,411,572., Cl. 414-24.500.

Hostettler, Hans U.; and Beyer, Horst, to Richardson-Vicks Inc. Stabilized cosmetic compositions. 4,411,886., Cl. 424-70.000.

Hotchkiss, Alan B.: *See*—
Silverman, Harold; and Hotchkiss, Alan B., 4,411,419., Cl. 271-263.000.

Hotchkiss, Harry W., to Kimberly-Clark Corporation. Tissue dispenser system, plastic overwrap package therefor. 4,411,374., Cl. 221-63.000.

Hottinger Baldwin Measurements, Inc.: *See*—
Lockery, Harry E.; and Laimins, Eric, 4,411,327., Cl. 177-211.000.

Houdaille Industries, Inc.: *See*—
Klein, Dean A.; Davis, Steven C.; and Wroblewski, Jerome J., 4,411,150., Cl. 72-461.000.
Schultz, John C., 4,411,341., Cl. 188-310.000.

House, William F.: *See*—
Edgerton, Bradly J.; House, William F.; and Michaels, Robert C., 4,412,096., Cl. 381-60.000.

Howard, Edward G., Jr., to Du Pont de Nemours, E. I., and Company. 1-Olefin polymerization catalyst. 4,411,821., Cl. 502-117.000.

Howard Machinery Limited: *See*—
Linger, Barry A., 4,411,322., Cl. 172-540.000.

Howlett, Charles W.: *See*—
Gardineer, Bayard G., Jr.; and Howlett, Charles W., 4,411,360., Cl. 206-313.000.

Hu, Chi P., to Honeywell Inc. Millimeter-wave stripline planar mixer. 4,412,354., Cl. 455-327.000.

Huang, Jiunn-Cherng, to Sin Sui Lai. Control device for the water tank of a flush toilet. 4,411,029., Cl. 4-324.000.

Hubbard, David W., to Pitney Bowes Inc. Low range automatic weighing device. 4,411,328., Cl. 177-212.000.

Hubby, John S., to Phillips Petroleum Company. Method for vapor recovery from a polymer slurry. 4,411,736., Cl. 159-47.100.

Huber, Gene A.: *See*—
Jones, Bradley N.; Harris, Robert J.; Cram, Ronald P.; and Huber, Gene A., 4,411,673., Cl. 55-41.000.

Hubert, Peter; and Vitzthum, Otto, to HAG Aktiengesellschaft. Process for the extraction of caffeine from super-critical solutions. 4,411,923., Cl. 426-271.000.

Hubner, Rudolf; and Grabenhorst, Rolf, to Vereinigte Flugtechnische Werke GmbH. Frame for PC-boards. 4,411,483., Cl. 339-17.00M.

Hudson, John O.: *See—*
Robinson, Ronald A.; and Hudson, John O., 4,411,831., Cl. 252-554.000.

Huffman, Joseph K., to Teltone Corporation. Phase jitter detector. 4,412,299., Cl. 364-570.000.

Hughes Aircraft Company: *See—*
Chen, John Y., 4,411,058., Cl. 29-571.000.
Terbrack, William H.; and Hummel, Terry L., 4,412,355., Cl. 455-603.000.

Hughes Tool Company: *See—*
Baker, Randy S.; and Price, H. R., 4,411,315., Cl. 166-187.000.

Hulin, Jean P.: *See—*
Dubois, Gilles; and Hulin, Jean P., 4,411,130., Cl. 57-352.000.

Hummel, Terry L.: *See—*
Terbrack, William H.; and Hummel, Terry L., 4,412,355., Cl. 455-603.000.

Hunter Douglas, Inc.: *See—*
Anderson, Richard N., 4,411,401., Cl. 248-262.000.

Hyde, Roger J., to Alumasc Limited. Valve-type closure for containers. 4,411,287., Cl. 137-315.000.

Hydril Company: *See—*
Lewis, George E., 4,411,434., Cl. 277-27.000.

Hye, A. B. M. Abdul: *See—*
Johnson, J. Wallace; and Hye, A. B. M. Abdul, 4,411,313., Cl. 166-90.000.

Hynes, Frank R.: *See—*
Kukucka, William P.; Hynes, Frank R.; Jones, Hugh L.; and Thompson, David M., 4,411,515., Cl. 355-14.0SH.

Ichikawa, Hiroaki: *See—*
Matsumura, Nobutake; Hoshikawa, Ryusuke; Sugiura, Yoshihide; Ichikawa, Hiroaki; and Sato, Syoji, 4,412,237., Cl. 357-42.000.

Ichikawa, Shinji: *See—*
Tanahashi, Toshio; Sumitani, Sinya; Matuura, Takeo; Ichikawa, Shinji; and Okuno, Takao, 4,411,845., Cl. 261-65.000.

Ichimura, Takeo: *See—*
Ogino, Makoto; Fujiu, Takamitsu; Kariya, Michio; and Ichimura, Takeo, 4,411,624., Cl. 433-173.000.

Ieaki, Miura: *See—*
Katsumori, Teiji; Kato, Tetuo; and Ieaki, Miura, 4,411,342., Cl. 188-315.000.

Igashira, Toshihiko; Tanaka, Takeshi; Sekiguchi, Kiyonori; and Yanagihara, Hiromichi, to Nippon Soken, Inc.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Method and apparatus for controlling EGR in internal combustion engine. 4,411,242., Cl. 123-569.000.

IHC Holland N.V.: *See—*
de Jager, Arie, 4,411,079., Cl. 37-58.000.

Iida, Shinya: *See—*
Komatsu, Hideo; Iida, Shinya; Mizutani, Tatsumi; and Ueki, Kazuyoshi, 4,412,119., Cl. 219-121.0PF.

Ikeda, Kotaro: *See—*
Fujii, Kiyonobu; Ikeda, Kotaro; Okuno, Kenji; Saito, Koichi; and Ohara, Osamu, 4,412,103., Cl. 179-115.50R.

Ikeda, Tomoaki: *See—*
Washizawa, Yasuo; Shinozaki, Fumiaki; Ikeda, Tomoaki; and Nakao, Sho, 4,411,983., Cl. 430-325.000.

Ikekawa, Nobuo: *See—*
DeLuca, Hector F.; Tanaka, Yoko; Ikekawa, Nobuo; and Kobayashi, Yoshiro, 4,411,833., Cl. 260-239.55R.

Imaging Technology Limited: *See—*
James, Paul M., 4,411,513., Cl. 355-5.000.

Imai, Hideo, to Kawasaki Electric Wire Co., Ltd. Fully automatic apparatus for producing an electrical cord of a predetermined length with a plug attached thereto. 4,411,181., Cl. 83-150.000.

Imai, Toshihiro, to Olympus Optical Company Ltd. In-focus detector for binocular stereoscope. 4,412,127., Cl. 250-204.000.

Imamura, Nobutake; and Ota, Chuichi, to Kokusai Denshin Denwa Co., Ltd. Magneto-optic recording medium. 4,412,264., Cl. 360-131.000.

Imazeki, Ryoji; and Yamazaki, Etsuo, to Fujitsu Fanuc Limited. Tracer control equipment. 4,412,295., Cl. 364-520.000.

Immunex Corporation: *See—*
Gillis, Steven, 4,411,992., Cl. 435-68.000.

Imperial Chemical Industries PLC: *See—*
Notman, Alan, 4,411,877., Cl. 423-359.000.

Inada, Masami; and Nomura, Isshi, to Aisin Seiki Kabushiki Kaisha. Electromagnetic flow control valve assembly. 4,411,406., Cl. 251-129.000.

Inamoto, Yoshiaki: *See—*
Fujikura, Yoshiaki; Inamoto, Yoshiaki; Takaishi, Naotake; and Nakajima, Motoki, 4,411,828., Cl. 252-522.00R.

Indak Manufacturing Corp.: *See—*
Schaad, William J.; Black, Charles E., III; and Halstead, Raymond T., 4,412,109., Cl. 200-16.00C.

Ingalls, Marjorie D.; and Ingalls, Richard D. Color reference data base and method of preparing same. 4,411,529., Cl. 356-421.000.

Ingalls, Richard D.: *See—*
Ingalls, Marjorie D.; and Ingalls, Richard D., 4,411,529., Cl. 356-421.000.

Ingersoll Milling Machine Company, The: *See—*
Johnson, William B., 4,411,564., Cl. 407-113.000.

Ingersoll-Rand Company: *See—*
Boothroyd, Howard W.; and Carlsmith, Lawrence A., 4,411,635., Cl. 464-33.000.

Ingle, William M.: *See—*
Darnell, Robert D.; Goetz, Carl A.; and Ingle, William M., 4,411,619., Cl. 432-1.000.

Inoue, Hiroshi: *See—*
Sasaki, Yoshikazu; Inoue, Hiroshi; Miura, Tadashi; Kumamoto, Kazuo; and Toudou, Sumio, 4,411,952., Cl. 428-332.000.

Inoue, Takeo; and Shirazawa, Takashi, to Mitsubishi Denki Kabushiki Kaisha. Insulated pipe joint. 4,411,457., Cl. 285-52.000.

Inoue, Tokuta: *See—*
Okumura, Takeshi; Nakanishi, Kiyoshi; and Inoue, Tokuta, 4,411,226., Cl. 123-188.00M.

Inst. Nat. de la Recherche Agronomique: *See—*
Voegele, Jean D.; Jourdheuil, Pierre E. J.; and Daumal, Jeanne, 4,411,220., Cl. 119-1.000.

Institut de Recherches de la Siderurgie Francaise: *See—*
Lechevallier, Christian, 4,411,412., Cl. 266-242.000.

Institut Francais du Petrole: *See—*
Desbrandes, Robert, 4,412,180., Cl. 324-373.000.
Ecomard, Andre; and Briand, Louis, 4,411,238., Cl. 123-501.000.

Institute of Technology Precision Electrical Discharge Works: *See—*
Takahashi, Kenichi; Hirano, Koichi; and Futamura, Shoji, 4,411,175., Cl. 76-107.00R.

Intel Corporation: *See—*
Korsh, George J.; Holler, Mark A.; Perlegos, George; and Gargini, Paolo, 4,412,310., Cl. 365-185.000.

International Business Machines Corporation: *See—*
Berger, Horst H.; and Wiedmann, Siegfried K., 4,412,312., Cl. 365-189.000.
Bergeron, David L., 4,412,308., Cl. 365-105.000.
Bohg, Armin; and Hartmann, Kurt, 4,412,197., Cl. 335-256.000.
Cambier, Graig S.; and Trubell, Lawrence P., 4,412,278., Cl. 363-126.000.
Case, William J.; and Wallis, Christopher N., 4,412,165., Cl. 318-636.000.
Chase, Brian D., 4,412,194., Cl. 335-210.000.
Crider, Chester H.; and Linton, Charles R., 4,412,166., Cl. 318-696.000.
Froment, Jean-Claude; Marijon, Jean-Louis; Orengo, Gerard; and Verhaeghe, Michel, 4,412,335., Cl. 375-3.000.
Narken, Bernt; and Schick, Henry C., 4,411,972., Cl. 430-5.000.

International Flavors & Fragrances Inc.: *See—*
Light, Kenneth K.; McGhie, Joseph A.; Fujioka, Futoshi; and Yoshida, Takao, 4,411,830., Cl. 252-522.00R.
Light, Kenneth K.; Schreiber, William L.; McGhie, Joseph A.; Schreck, Ronald P.; Yoshida, Takao; Schreiber, Loren B.; and Muralidhara, Ranya, 4,412,083., Cl. 564-279.000.

International Rectifier Corporation: *See—*
Herman, Thomas; and Lidow, Alexander, 4,412,242., Cl. 357-52.000.

International Standard Electric Corporation: *See—*
Chown, Martin; and Farrington, Jeffrey G., 4,411,526., Cl. 356-350.000.
Crossland, William A.; and Coates, David, 4,411,494., Cl. 350-339.00R.
Kautz, Werner, 4,412,223., Cl. 343-844.000.

International Telephone & Telegraph Corporation: *See—*
November, Milton H., 4,411,161., Cl. 73-861.030.

Interstate Electronics Corporation: *See—*
An, Byung H., 4,412,098., Cl. 381-43.000.

Inventio AG: *See—*
Schroder, Joris; Bosshard, Hans; Kiml, Jiri; Kostka, Miroslav; and Zimmermann, Walter, 4,411,337., Cl. 187-29.00R.

Iomega Corporation: *See—*
Cornaby, David T., 4,412,161., Cl. 318-561.000.

Iowa State University Research Foundation, Inc.: *See—*
Klaus, Jack C.; Schroeder, Larry D.; Casteel, Vincent H.; and Schwartz, Kenneth E., 4,412,356., Cl. 455-603.000.
Lutenegger, Alan J.; and Pitt, John M., 4,411,160., Cl. 73-843.000.

Isaka, Kinichi; Kawaguchi, Masashi; and Uede, Hisashi, to Sharp Kabushiki Kaisha. Aging method for thin-film electroluminescent display element. 4,412,155., Cl. 315-246.000.

Ishibashi, Tadashi: *See—*
Tanaka, Hironari; Ishibashi, Tadashi; and Koyama, Masaharu, 4,412,214., Cl. 340-765.000.

Ishida, Tokuzi, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Method of controlling EGR for internal combustion engines. 4,411,241., Cl. 123-568.000.

Ishigaki, Yukinobu; Totsuka, Kaoru; Yamamoto, Makoto; and Miyaji, Naotaka, to Victor Company of Japan, Ltd. Variable-directivity microphone device. 4,412,097., Cl. 381-92.000.

Ishii, Isao; Murakami, Tadaki; Sakamoto, Yoshiaki; Utsumi, Yoshikazu; Nakamura, Tatsuharu; and Takayanagi, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Arc resistant insulator. 4,412,010., Cl. 501-153.000.

Ishikawa, Masaru: *See—*
Miyamoto, Akira; Ishikawa, Masaru; Nishi, Masaaki; Ishizawa, Kenki; and Shiranita, Akira, 4,412,008., Cl. 501-97.000.

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Wildeboer, Nicolaas, 4,412,093., Cl. 174-52.0FP.
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Shumaker, John F., 4,411,584., Cl. 414-694.000.
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Jaeger, Walter, to GX-Holding AG. Method of reproducing colored motion pictures. 4,412,243., Cl. 358-334.000.
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Frame, Norman J.; Walber, James P.; and Janick, Jan M., 4,412,209., Cl. 340-365.00C.
Janome Sewing Machine Co. Ltd.: *See*—
Kubo, Keizo, 4,411,196., Cl. 101-269.000.
Jansen, Leonardus G. J.: *See*—
Hageman, Hendrik J.; Giezen, Egenius A.; and Jansen, Leonardus G. J., 4,411,822., Cl. 502-168.000.
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Kaetsu, Isao; Yoshida, Masaru; and Kumakura, Minoru, 4,411,754., Cl. 204-159.150.
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Boyum, George A.; Renner, Robert A.; and Lovelace, Ralph, 4,411,070., Cl. 30-379.500.
Jean Walterscheid GmbH: *See*—
Buthe, Theo; and Mikeska, Felix, 4,411,636., Cl. 464-172.000.
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Jenn-Air Corporation, The: *See*—
Field, Thomas R.; and Simon, Donald J., 4,411,254., Cl. 126-300.000.
Jensen, Marvin E.; and Mohiuddin, Mahmood, to Hollister Incorporated. Drainable collection pouch and filter assembly therefor. 4,411,659., Cl. 604-332.000.
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Tsuno, Katsushige, 4,412,132., Cl. 250-396.0ML.
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Jim Ray Company, Inc.: *See*—
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Jodrey, Robert M.; and Scott, Robert J., to Dennison Manufacturing Company. Web tension control apparatus. 4,411,393., Cl. 242-75.430.
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Schwefel, Ernst, 4,412,206., Cl. 340-347.00P.
John, E. Roy. System and method for electrode pair derivations in electroencephalography. 4,411,273., Cl. 128-731.000.
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Johnson, Norman B.: *See*—
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Johnson, William B., to Ingersoll Milling Machine Company, The. Indexable cutting insert having radiused cutting edges. 4,411,564., Cl. 407-113.000.
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Jopling, Aunald. Mining system. 4,411,559., Cl. 405-300.000.

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Jourdan, Francis; Marquet, Patrice; and Ternant, Francois, to Thomson-CSF. Optoelectric detection device especially for laser radiation. 4,411,521., Cl. 356-225.000.

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Voegele, Jean D.; Jourdheuil, Pierre E. J.; and Daumal, Jeanne, 4,411,220., Cl. 119-1.000.

Judice, Clay, to Strokee Enterprises. Golf putting practice device. 4,411,431., Cl. 273-183.00C.

Julius Blum Gesellschaft m.b.H.: *See*—
Rock, Erich; and Brustle, Klaus, 4,411,045., Cl. 16-243.000.

Juric, Ilija. Tamper-proof fastener. 4,411,570., Cl. 411-271.000.

Kabat, John L., to Honeywell Inc. Thermostat with improved temperature sensing circuit. 4,411,306., Cl. 165-12.000.

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Itemadani, Eiji; Mori, Kazuhiro; Tanaka, Sohei; and Kabeshita, Akira, 4,411,362., Cl. 206-330.000.

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Hess, James B.; and Strahl, Erwin O., 4,411,758., Cl. 204-243.00R.

Kaiser, Klaus-Peter: *See*—
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Kakinuma, Nobuo: *See*—
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Kamatani, Yoshio; and Fujita, Noriaki, to Takeda Chemical Industries, Ltd. Isocyanate composition. 4,412,072., Cl. 544-68.000.

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Kamen, Dean L., to Baxter Travenol Laboratories, Inc. Fluid flow control system. 4,411,649., Cl. 604-65.000.

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Kano, Mitsuru: *See*—
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Fujikura, Yoshiaki; Inamoto, Yoshiaki; Takaishi, Naotake; and Nakajima, Motoki, 4,411,828., Cl. 252-522.00R.

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Karsh, Herbert; and Karsh, Irving, to Bell & Howell Company. Bidirectional tape drive systems. 4,411,397., Cl. 242-192.000.

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Karsh, Herbert; and Karsh, Irving, 4,411,397., Cl. 242-192.000.

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Kassai, Kenzou, to Kassai Kabushikikaisha. Hammock for baby carriages. 4,411,472., Cl. 297-430.000.

Kastner, Arnold. Cigarette making machine. 4,411,278., Cl. 131-70.000.

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Kato, Tetuo: *See*—
Katsumori, Teiji; Kato, Tetuo; and Ieaki, Miura, 4,411,342., Cl. 188-315.000.

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Kaufhold, Wolfgang, to Siemens Aktiengesellschaft. Circuit arrangement for damping power oscillations of synchronous generators in networks. 4,412,171., Cl. 322-20.000.

Kautz, Werner, to International Standard Electric Corporation. Antenna array with element isolation in the coupling network. 4,412,223., Cl. 343-844.000.

Kawada, Haruki: *See*—
Kitahara, Shizuo; Hirokawa, Yoshitsugu; Kawada, Haruki; Fujii, Toshihiro; Sugi, Nagatoshi; Hasegawa, Hiroaki; and Yoshioka, Akira, 4,412,031., Cl. 524-526.000.
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Kawai Musical Instrument Mfg. Co., Ltd: *See*—
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Kawai, Shinji; Suzuki, Koichi; and Yamaguchi, Yuji, to Aisin Seiki Kabushiki Kaisha. Apparatus for drying genitals and the posterior parts of human body. 4,411,030., Cl. 4-443.000.

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Kawasaki Electric Wire Co., Ltd.: *See*—
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Yanagisawa, Zensuke, 4,411,608., Cl. 425-123.000.

Kawasaki Kabushiki Kaisha: *See*—
Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; and Wakabayashi, Takeshi, 4,411,765., Cl. 208-8.0LE.

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Kaya, Azmi; Keyes, Marion A.; and Scheib, Thomas J., to Babcock & Wilcox Company, The. Load control for energy converters. 4,412,136., Cl. 290-40.00R.

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Kazumi, Jiro, to Canon Kabushiki Kaisha. Annunciator for a focus adjusting device. 4,411,508., Cl. 354-198.000.

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Keeler Brass Company: *See*—
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Kehr, Dieter; and Viebranz, Manfred, to Minnesota Mining and Manufacturing Company. Elastomeric composition for providing electrical stress control. 4,412,029., Cl. 524-441.000.

Keith, Jack L.; and Gies, Thomas E., to Gies, Thomas E. Apparatus for protecting the frame surrounding a window or door opening and a window or door within the opening. 4,411,219., Cl. 118-505.000.

Kelch, Heinz, to Kienzle Apparate GmbH. Fuel cooling system for use with a closed fuel injection circuit in a diesel engine. 4,411,239., Cl. 123-557.000.

Kell, Michael J., to Cordis Dow Corp. Diaphragm type blood pump for medical use. 4,411,603., Cl. 417-479.000.

Keller, Max P. Adjustable indicator holders. 4,411,402., Cl. 248-284.000.

Keller, Michael: *See*—
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Kelley, Robert B.; Birk, John R.; Martins, Henrique; and Tella, Richard P. Robot system which acquires cylindrical workpieces from bins. 4,412,293., Cl. 364-513.000.

Kelly, Danny R. Vehicle attached support for wheelchair transport. 4,411,580., Cl. 414-462.000.

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Butler, Robert S.; Claerbout, Paul F.; Kent, Louis P.; Cleland, Randy S.; Wilhelm, James H.; and Micko, Richard E., 4,411,875., Cl. 423-242.000.

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Kettle, John L., to Otis Elevator Company. Racetrack escalator. 4,411,352., Cl. 198-328.000.

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Marcovici, Mitch, 4,411,166., Cl. 74-89.000.

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Kaya, Azmi; Keyes, Marion A.; and Scheib, Thomas J., 4,412,136., Cl. 290-40.00R.

Keyser, Frank: *See*—
Holmes, George; and Keyser, Frank, 4,411,531., Cl. 366-76.000.

Keystone International, Inc.: *See*—
Scobie, William B., 4,411,438., Cl. 277-105.000.

Khadder, Wadie N.; Wang, Jia T.; and Hollins, Brian E., to National Semiconductor Corporation. Simplified BIFET structure. 4,412,238., Cl. 357-43.000.

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Nagura, Masato; Kikuchi, Kazushige; Obara, Hiroshi; and Endo, Yasushi, 4,412,147., Cl. 310-320.000.

Kikuchi, Noribumi: *See*—
Itaba, Takeshi; Nishiyama, Akio; Kikuchi, Noribumi; Shingyoji, Takayuki; and Ohsawa, Yuzo, 4,411,763., Cl. 204-298.000.

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Killinger, Karl H., to Singer Company, The. Actuating mechanism for a double pointed looper in a sewing machine. 4,411,210., Cl. 112-199.000.

Kilmer, John B. Energy translation device having individually compensated sliding valves and counterbalancing mechanism. 4,411,190., Cl. 91-487.000.

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Ornstein, Leonard; and Kim, Young R., 4,412,004., Cl. 436-10.000.

Kimata, Kei; Nakazeki, Taugito; and Yasuda, Yoshinobu, to NTN Toyo Bearing Co., Ltd. Air flow measuring device for internal combustion engines. 4,411,244., Cl. 123-389.000.

Kimberly-Clark Corporation: *See*—
Hotchkiss, Harry W., 4,411,374., Cl. 221-63.000.

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Schroder, Joris; Bosshard, Hans; Kiml, Jiri; Kostka, Miroslav; and Zimmermann, Walter, 4,411,337., Cl. 187-29.00R.

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Kimura, Shigeru, to Nifco Inc. Filter for gasoline tank. 4,411,788., Cl. 210-439.000.

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Katsumata, Naoto; Horiuchi, Noriaki; and Kimura, Shigeru, 4,411,140., Cl. 62-324.200.

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King, Reginald D. Trench compactor having a vibratory sheepsfoot assembly. 4,411,081., Cl. 37-117.500.

King, Richard T.: *See*—
Halgrimson, Darrell N.; Hanson, Donald H.; and King, Richard T., 4,412,297., Cl. 364-559.000.

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Sakai, Shinji; Shinoda, Nobuhiko; Hosoe, Kazuya; and Kinoshita, Takao, 4,411,505., Cl. 354-25.000.

Kioritz Corporation: *See*—
Takahashi, Hiroshi; and Saito, Yasuo, 4,411,071., Cl. 30-381.000.

Kirk, Norbert A. Blade housing device for cast cutting tool. 4,411,067., Cl. 30-124.000.

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Morikawa, Masaki; Yoshida, Hideaki; Kishida, Kunio; and Tanaka, Chuji, 4,411,864., Cl. 420-587.000.

Kissell, John J.: *See*—
Dougherty, Timothy S.; Kissell, John J.; and Schmehl, Glenn L., 4,412,094., Cl. 174-110.00F.

Kitada, Masahiro; Suenaga, Masahide; Tsukada, Yukihisa; Shimizu, Noboru; and Yamamoto, Hiroshi, to Hitachi, Ltd. Formation of electrodes for magnetoresistive sensor. 4,411,757., Cl. 204-192.00E.

Kitagawa, Hironoshin: *See*—
Shigesada, Shigeki; Kitagawa, Hironoshin; Mihara, Toshio; and Ishimatsu, Yoshiaki, 4,411,999., Cl. 435-177.000.

Kitahara, Shizuo; Hirokawa, Yoshitsugu; Kawada, Haruki; Fujii, Toshihiro; Sugi, Nagatoshi; Hasegawa, Hiroaki; and Yoshioka, Akira, to Nippon Zeon Co., Ltd. Modified rubber composition employing a compound containing a carboxyl and an aldehyde group. 4,412,031., Cl. 524-526.000.

Kitahara, Shizuo; Hirokawa, Yoshitsugu; Kawada, Haruki; Fujii, Toshihiro; Sugi, Nagatoshi; Hasegawa, Hiroaki; and Yoshioka, Akira, to Nippon Zeon Co. Ltd. Process for modifying rubbers employing a compound containing a carboxyl and an aldehyde group. 4,412,041., Cl. 525-154.000.

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Kitamura, Koichiro, to Kitamura Machinery Co., Ltd. Protective system for automatic tool changing apparatus. 4,412,162., Cl. 318-563.000.

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Kitamura, Koichiro, 4,412,162., Cl. 318-563.000.

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Ando, Hideo; Hayashi, Akira; and Kitano, Kyozo, 4,411,815., Cl. 252-353.000.

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Ohmura, Eiichi; and Kitano, Tateo, 4,411,103., Cl. 49-502.000.

Kivenson, Gilbert. Catapult construction. 4,411,248., Cl. 124-20.00R.

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Asjes, Ronald J.; van Peppen, Jacobus C. L.; and Klaassen, Klaas B., 4,412,317., Cl. 367-185.000.

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Scholl, Michael; and Klassen, Herbert, 4,411,143., Cl. 68-12.00R.

Klaus, Jack C.; Schroeder, Larry D.; Casteel, Vincent H.; and Schwartz, Kenneth E., to Iowa State University Research Foundation, Inc. Light actuated remote control security system. 4,412,356., Cl. 455-603.000.

Kleemann, Axel: *See*—
Bethge, Horst; Kleemann, Axel; and Martens, Jurgen, 4,411,840., Cl. 260-501.120.

Klein, Dean A.; Davis, Steven C.; and Wroblewski, Jerome J., to Houdaille Industries, Inc. Backgauge structure. 4,411,150., Cl. 72-461.000.

Klein, Denys C., to Compagnie de Signaux et d'Entreprises Electriques. Start up frequency adjustment in an electronic power device for a discharge lamp. 4,412,154., Cl. 315-224.000.

Klein, Kenneth; Bator, Patricia E.; and Pact, Harry H., to Henkel Corporation. Thickened ketone compositions. 4,412,027., Cl. 524-364.000.

Klein, Robert E.: *See*—
Bailey, David C.; and Klein, Robert E., 4,411,503., Cl. 352-222.000.

Klicker, Kenneth A.; Newnham, Robert E.; Cross, Leslie E.; and Biggers, James V., to United States of America, Navy. PZT Composite and a fabrication method thereof. 4,412,148., Cl. 310-358.000.

Klimpel, Richard R.: *See*—
Bermudez, Mauricio; Klimpel, Richard R.; and Sands, Steven D., 4,411,927., Cl. 426-618.000.

Kline, George A., to Diamond Shamrock Corporation. Titanium clad copper electrode and method for making. 4,411,762., Cl. 204-290.00F.

Klipstein, Frederick A.; Engert, Richard E.; and Clements, John D., to University of Kochester, The. Composition of a novel immunogen for protection against diarrheal disease caused by enterotoxigenic *Escherichia coli*. 4,411,888., Cl. 424-92.000.

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Kobayashi, Nobuyuki: *See*—
Shinoda, Kazuo; Kobayashi, Nobuyuki; and Isobe, Toshiaki, 4,411,235., Cl. 123-488.000.

Kobayashi, Toshiyuki, to Mitsubishi Denki Kabushiki Kaisha. Electrode unit for electrically heating underground hydrocarbon deposits. 4,412,124., Cl. 219-277.000.

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De Luca, Hector F.; Tanaka, Yoko; Ikekawa, Nobuo; and Kobayashi, Yoshiro, 4,411,833., Cl. 260-239.55R.

Koblitz, Franics F.; and Reichart, Jane L., to Dentsply Research & Development Corp. Broad spectrum light curable dental compositions. 4,411,625., Cl. 433-217.000.

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Gruber, Bruce A.; Koch, Diether; Langer, Heimo J.; and Dunnavant, William R., 4,412,088., Cl. 585-23.000.

Koehler, Albert M.: *See*—
Radovan, Felix S.; Koehler, Albert M.; and Ray, Donald R., 4,411,408., Cl. 254-108.000.

Koehler Manufacturing Company: *See*—
Sundberg, Erik G., 4,411,969., Cl. 429-50.000.

Koenig, Karl-Heinz; and Feuerherd, Karl-Heinz, to BASF Aktiengesellschaft. Preparation of 1-monochloroethylcarbamyl chloride. 4,411,752., Cl. 204-158.0HA.

Koerdt, Reinhold; Schwiers, Hans-Georg; and Schoening, Josef, to Hochtemperatur-Reaktorbau GmbH. Vaulted cover assembly to close a vertical recess in a pressure vessel. 4,411,308., Cl. 165-70.000.

Koffel, William K.; Tuley, Eugene N.; Gay, Charles H., Jr.; Troeger, Raymond E.; and Sterman, Albert P., deceased (by Sterman, Florence G., executrix), to United States of America, National Aeronautics and Space Administration. Tip cap for a rotor blade. 4,411,597., Cl. 416-92.000.

Koflach Sportgerate Gesellschaft: *See*—
Bucheder, Erwin, 4,411,078., Cl. 36-117.000.

Kohl, Lou; Peschke, John R.; and Wecker, Sheldon M., to James River-Dixie/Northern, Inc. Method for forming a plurality of objects from a plurality of superimposed sheets. 4,411,849., Cl. 264-45.500.

Koike, Norio: *See*—
Sasano, Akira; Nakano, Toshio; Tsutsui, Ken; Hashimoto, Michiaki; Kaneko, Tadao; Koike, Norio; and Izumi, Akiya, 4,412,236., Cl. 357-31.000.

Koike, Shoichi, to Nissan Motor Company, Limited. Automobile door structure. 4,411,466., Cl. 296-188.000.

Kojima, Akira; and Sakai, Toshiyasu, to Nippondenso Co., Ltd. DC Motor driving apparatus. 4,412,160., Cl. 318-280.000.

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Shiga, Akinobu; Naito, Yukio; Sasaki, Toshio; Kojima, Junpei; and Yoshioka, Hiroshi, 4,412,049., Cl. 526-127.000.

Kokelenberg, Hendrik E.: *See*—
Laridon, Urbain L.; Kokelenberg, Hendrik E.; and Samijn, Rafael P., 4,411,978., Cl. 430-157.000.

Kokusai Denshin Denwa Co., Ltd.: *See*—
Imamura, Nobutake; and Ota, Chuichi, 4,412,264., Cl. 360-131.000.

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Mochizuki, Kiyofumi; Wakabayashi, Hiroharu; and Niiro, Yasuhiko, 4,411,520., Cl. 356-73.100.

Kolegraff, Kenneth J.; and Allen, David T., to Deere & Company. Shearbar clearance detector. 4,412,212., Cl. 340-684.000.

Kollar, John. Process for producing ethylene glycol. 4,412,084., Cl. 568-852.000.

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Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; and Wakabayashi, Takeshi, 4,411,765., Cl. 208-8.0LE.

Komatsu Forklift Kabushiki Kaisha: *See*—
Nakada, Shoichi, 4,411,582., Cl. 414-636.000.

Komatsu, Hideo; Iida, Shinya; Mizutani, Tatsumi; and Ueki, Kazuyoshi, to Hitachi, Ltd. Method for dry-etching. 4,412,119., Cl. 219-121.0PF.

Komatsu, Michiyasu; Tsuge, Akihiko; Komeya, Katsutoshi; and Ando, Akio, to Tokyo Shibaura Denki Kabushiki Kaisha. Sintered Si_3N_4 body. 4,412,009., Cl. 501-97.000.

Komeno, Junji, to Fujitsu Limited. Method for a vapor phase growth of a compound semiconductor. 4,411,729., Cl. 156-612.000.

Komeya, Katsutoshi: *See*—
Komatsu, Michiyasu; Tsuge, Akihiko; Komeya, Katsutoshi; and Ando, Akio, 4,412,009., Cl. 501-97.000.

Kominami, Yasuo; Sato, Tetsuo; and Ohkubo, Yuichi, to Hitachi, Ltd. Switchable signal compressor/signal expander. 4,412,189., Cl. 333-14.000.

Komori, Shigehiro; and Ogawa, Hiroshi, to Canon Kabushiki Kaisha. Variable magnification electrophotographic copying apparatus. 4,411,514., Cl. 355-14.0CH.

Kondo, Masatoshi: *See*—
Shibuya, Chuji; Kaneda, Satoshi; Kanehisa, Takashi; Kondo, Masatoshi; Nogawa, Kenji; and Hasuike, Fumio, 4,411,982., Cl. 430-314.000.

Kondo, Takashi, to Minolta Camera Kabushiki Kaisha. Position control device for movable member. 4,411,507., Cl. 354-195.000.

Kondo, Toshikatsu: *See*—
Asano, Kiyomitsu; Kondo, Toshikatsu; and Mizuno, Shigeru, 4,411,538., Cl. 400-124.000.

Konig, Walter: *See*—
Weber, Helmut; Reitberger, Peter H.; Bader, Leonhard; and Konig, Walter, 4,412,232., Cl. 346-140.00R.

Konishiroku Photo Industry Co., Ltd.: *See*—
Tarumi, Noriyoshi; Kimura, Kiyoshi; and Miwa, Tadashi, 4,411,977., Cl. 430-126.000.

Kontek - Tecnologie della Conservazione - S.R.L.: *See*—
Cimino, Andrea; Plicchi, Gianni; Mangiarotti, Luigi; Rossi, Maurizio; Betti, Vittorio; Spighi, Massimo; and Zingaretti, Gabriele, 4,411,918., Cl. 426-124.000.

Koppensteiner, James V.; and Onesto, Joseph B., to GTE Automatic Electric Labs Inc. Circuit card extractor. 4,411,064., Cl. 29-764.000.

Korol, Vyacheslav K.: *See*—
Denisov, Vladimir A.; Kulevskaya, Elena F.; Zhiltsov, Jury S.; Kuznetsova, Olga M.; Novakovskaya, Zoya D.; Kozlov, Vyacheslav I.; Korol, Vyacheslav K.; and Pershin, Nikolai I., 4,412,144., Cl. 310-49.00R.

Korsh, George J.; Holler, Mark A.; Perlegos, George; and Gargini, Paolo, to Intel Corporation. EPROM Cell with reduced programming voltage and method of fabrication. 4,412,310., Cl. 365-185.000.

Koseki, Yoshihiro: *See*—
Nagamoto, Masanaka; Koseki, Yoshihiro; and Iwata, Susumu, 4,411,979., Cl. 430-176.000.

Koshimizu, Naganori, to Tokico Ltd. Hydraulic pressure control valve. 4,411,476., Cl. 303-6.00C.

Kosner, Jerry J., to Bell & Howell Company. Vacuum document feeder. 4,411,416., Cl. 271-11.000.

Kosonocky, Walter F., to RCA Corporation. Charge transfer circuits with dark current compensation. 4,412,343., Cl. 377-58.000.

Koss, Walter. Penis prosthesis. 4,411,260., Cl. 128-79.000.

Kostka, Miroslav: *See*—
Schroder, Joris; Bosshard, Hans; Kiml, Jiri; Kostka, Miroslav; and Zimmermann, Walter, 4,411,337., Cl. 187-29.00R.

Kotani, Hideo: *See*—
Sato, Shinichi; Harada, Hiroshi; Fukumoto, Takaaki; Takano, Hirozo; Kotani, Hideo; and Kayano, Shinpei, 4,411,929., Cl. 427-38.000.

Kovar, Robert F.: *See*—
Bouley, Robert W.; and Kovar, Robert F., 4,412,012., Cl. 521-54.000.

Koyama, Masaharu: *See*—
Tanaka, Hironari; Ishibashi, Tadashi; and Koyama, Masaharu, 4,412,214., Cl. 340-765.000.

Kozlov, Vyacheslav I.: *See*—
Denisov, Vladimir A.; Kulevskaya, Elena F.; Zhiltsov, Jury S.; Kuznetsova, Olga M.; Novakovskaya, Zoya D.; Kozlov, Vyacheslav I.; Korol, Vyacheslav K.; and Pershin, Nikolai I., 4,412,144., Cl. 310-49.00R.

Kraftwerk Union Aktiengesellschaft: *See*—
Steinberg, Eckard, 4,411,861., Cl. 376-417.000.

Kramer, Horst; and Fassbender, Heinrich, to Hoechst Aktiengesellschaft. Testing method for determining the magnetic properties of ferromagnetic powders. 4,412,176., Cl. 324-204.000.

Kramer, Steven G.; and Yavitz, Edward Q., to University of California, The Regents of the. Internally sterile pulsatile infusor system. 4,411,652., Cl. 604-153.000.

Krampe & Co. Fertifung in Bergbaubedarf GmbH: *See*—
Best, Gerd; and Weikert, Norbert B., 4,411,475., Cl. 299-81.000.

Kraus, Gerard, to Phillips Petroleum Company. Asphalt compositions. 4,412,019., Cl. 524-71.000.

Kraus, John W., to Trans-World Manufacturing Corp. Display with changeable characters. 4,411,084., Cl. 40-450.000.

Krautkremer, Franz; and Lais, Siegfried, to Schottel-Werft, Josef Becker GmbH & Co KG. Water-jet drive mechanism for the driving of watercraft. 4,411,630., Cl. 440-42.000.

Kravetz, John J. Method and apparatus for the prevention of low temperature diesel engine failure. 4,411,240., Cl. 123-557.000.

Kreissig, Ernst F., to Schweizerische Lokomitiv-und Maschinenfabrik. Rail vehicle. 4,411,202., Cl. 105-199.00R.

Kremer, Karl J.; Brauner, Jochen; Glaubitz, Klaus-Dieter; Eckstein, Helmut; and Bruggemann, Josef, to Krup Stahl, A.G. Apparatus for the spectrometric analysis of the chemical composition of metallic parts. 4,411,524., Cl. 356-313.000.

Kremers, Jan H.; and Bolles, Robert C., to S R I International. Implement positioning apparatus and process. 4,412,121., Cl. 219-124.340.

Kress, Hans-Jurgen: *See*—
Heitz, Walter; Kress, Hans-Jurgen; and Stix, Wolfgang. 4,412,063., Cl. 528-409.000.

Kreuter, Erika; and Zilske, Wolfgang, to Degussa. Electrolytic palladium bath and process. 4,411,743., Cl. 204-47.000.

Kreyenbuhl, Armand, to Adidas - Fabrique de Chassures de Sport. Ski binding to secure a shoe to a ski. 4,411,445., Cl. 280-615.000.

Kriegner, Othmar; and Gruber, Gunther, to Voest-Alpine Aktiengesellschaft. Method of continuously measuring the temperature of the surface of a continuously cast strand over its length. 4,411,534., Cl. 374-141.000.

Krigbaum, William R.; Ciferri, Alberto; and Preston, Jack, to Duke University. High modulus cholesteric mesophase polymers. 4,412,059., Cl. 528-192.000.

Krisam, Gerd G.: *See*—
Lehmann, Hans-Dieter; Krisam, Gerd G.; and Golla, Ruth S., 4,412,000., Cl. 435-179.000.

Kroushl, Joseph A.; and Greenwood, Arthur R., to UOP Inc. Multiple stage reactor system. 4,411,869., Cl. 422-188.000.

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Kroymann, Howard B., to Raychem Corporation. Bi-directional temperature excursion sensing and locating apparatus. 4,411,536., Cl. 374-184.000.

Krup Stahl, A.G.: *See*—
Kremer, Karl J.; Brauner, Jochen; Glaubitz, Klaus-Dieter; Eckstein, Helmut; and Bruggemann, Josef, 4,411,524., Cl. 356-313.000.

Kryszewski, Marian: *See*—
Galeski, Andrzej; Kalinski, Ryszard; and Kryszewski, Marian, 4,411,704., Cl. 106-308.00Q.

Kubo, Keizo, to Janome Sewing Machine Co. Ltd. Imprinter with locking and releasing device. 4,411,196., Cl. 101-269.000.

Kudo, Mitsuhiro: *See*—
Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; Kimura, Takeshi; Kumasaka, Noriyuki; and Fujiwara, Hideo, 4,411,716., Cl. 148-403.000.

Kudo, Tetsuichi: *See*—
Gotoh, Akira; Obayashi, Hidehito; Nagai, Ryo; Mochizuki, Shouji; and Kudo, Tetsuichi, 4,411,971., Cl. 429-191.000.

Kughn, Richard P.: *See*—
Buehrig, Gordon M.; and Buehrig, Kathryn L., 4,411,462., Cl. 293-132.000.

Kuhlman, Bruce E.; and Kamerling, Marc A., to Optical Coating Laboratory, Inc. Transparent electromagnetic shield and method of manufacturing. 4,412,255., Cl. 358-245.000.

Kuhn, Lothar: *See*—
Wenderoth, Karl; and Kuhn, Lothar, 4,411,542., Cl. 400-697.100.

Kukucka, William P.; Hynes, Frank R.; Jones, Hugh L.; and Thompson, David M., to Xerox Corporation. Very high speed duplicator with limitless finishing function. 4,411,515., Cl. 355-14.0SH.

Kulevskaya, Elena F.: *See*—
Denisov, Vladimir A.; Kulevskaya, Elena F.; Zhiltsov, Jury S.; Kuznetsova, Olga M.; Novakovskaya, Zoya D.; Kozlov, Vyacheslav I.; Korol, Vyacheslav K.; and Pershin, Nikolai I., 4,412,144., Cl. 310-49.00R.

Kulite Semiconductor Products, Inc.: *See*—
Kurtz, Anthony D.; and Mallon, Joseph R., 4,412,203., Cl. 338-4.000.

Kumakura, Minoru: *See*—
Kaetsu, Isao; Yoshida, Masaru; and Kumakura, Minoru, 4,411,754., Cl. 204-159.150.

Kumamoto, Kazuo: *See*—
Sasaki, Yoshikazu; Inoue, Hiroshi; Miura, Tadashi; Kumamoto, Kazuo; and Toudou, Sumio, 4,411,952., Cl. 428-332.000.

Kumasaka, Noriyuki: *See*—
Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; Kimura, Takeshi; Kumasaka, Noriyuki; and Fujiwara, Hideo, 4,411,716., Cl. 148-403.000.

Kumpe, Gerhardt: *See*—
Schwinn, Horst; Heimburger, Norbert; Kumpe, Gerhardt; and Drescher, Heinz H., 4,411,794., Cl. 210-670.000.

Kunita, Shizuo; Akimoto, Osamu; Sugie, Osamu; Iyoda, Michio; and Suzuki, Kazuo, to Sanke Electric Co., Ltd.; and Nippondenso Co., Ltd. Distributorless ignition system for multicylinder internal-combustion engines. 4,411,247., Cl. 123-655.000.

Kunkel, Harold E., to Ex-Cell-O Corporation. Heat exchanger assembly. 4,411,309., Cl. 165-76.000.

Kuo, Clinton C. K., to Motorola, Inc. EEPROM With bulk zero program capability. 4,412,309., Cl. 365-184.000.

Kupersmit, Julius B. Foldable reinforcing element for shipping containers. 4,411,373., Cl. 220-470.000.

Kuraray Co., Ltd.: *See*—
Fujii, Kiyonobu; Ikeda, Kotaro; Okuno, Kenji; Saito, Koichi; and Ohara, Osamu, 4,412,103., Cl. 179-115.50R.
Hirai, Koji; Shirano, Kenji; and Okamura, Takayuki, 4,412,022., Cl. 524-104.000.

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Saito, Masumi; Hirai, Eiichi; and Endo, Masao, 4,411,701., Cl. 106-87.000.

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Nagura, Masato; Kikuchi, Kazushige; Obara, Hiroshi; and Endo, Yasushi, 4,412,147., Cl. 310-320.000.

Kurihara, Kazuhiko: *See*—
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Kurihara, Michio: *See*—
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Kurimoto Iron Works, Ltd.: *See*—
Takeuchi, Shigeru, 4,411,723., Cl. 156-242.000.

Kurita, Akitsugu, to Toshiba Silicones Ltd. Silicone emulsion composition. 4,412,035., Cl. 524-796.000.

Kuroda, Kunishige, to Hitachi, Ltd. Superconducting solenoid coil. 4,412,195., Cl. 335-216.000.

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Namba, Kenryo; Kuroiwa, Akihiko; and Nakagawa, Shiro, 4,412,231., Cl. 346-135.100.

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Ehemann, Gero, 4,411,051., Cl. 26-18.500.

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Kuzunuki, Soshiro; Hirasawa, Kotaro; Yuminaka, Takeo; and Yoneda, Kanji, to Hitachi, Ltd. Apparatus for calculating elevator cage call forecast. 4,411,338., Cl. 187-29.00R.

Kwan, Stephen C., to Alcon Laboratories, Inc. Method for the prevention of soilant deposits on contact lenses. 4,411,932., Cl. 427-164.000.

Kwech, Horst: *See*—
Wachs, Edward H.; and Kwech, Horst, 4,411,178., Cl. 82-4.00C.

Kwok, Sai W., to GTE Products Corporation. Differential current detector in cable television trunk amplifier station. 4,412,245., Cl. 358-86.000.

Kyle, James C., to Kyle, James C. Ceramic seal between spaced members such as a terminal pin and a ferrule. 4,411,680., Cl. 65-33.000.

Kytir, Walter. Winding machine for winding strand-shaped winding material on a spool. 4,411,396., Cl. 242-158.00R.

L.C.C.-C.I.C.E.-Compagnie Europeenne de Composants Electroniques: *See*—
Mentzer, Regis, 4,411,361., Cl. 206-329.000.

La Rochette-Cenpa: *See*—
Louis, Jacques; and Gauthier, Jean, 4,411,420., Cl. 271-276.000.

LaBelle, Stanley B.; and Hagquist, James A. E., to H. B. Fuller Company. One-part, curable polyurethane. 4,412,033., Cl. 524-590.000.

Lach, Horst. Trueing tool. 4,411,250., Cl. 125-11.0CD.

Lada, Henry: *See*—
Fishter, Robert E.; and Lada, Henry, 4,411,730., Cl. 156-626.000.

Ladd, Robert G.: *See*—
Poppe, Wassily; Craddock, Charles F.; Gutekunst, Robert W.; Ladd, Robert G.; and Mager, Sue A., 4,411,610., Cl. 425-174.400.

Laimins, Eric: *See*—
Lockery, Harry E.; and Laimins, Eric, 4,411,327., Cl. 177-211.000.

Lais, Siegfried: *See*—
Krautkremer, Franz; and Lais, Siegfried, 4,411,630., Cl. 440-42.000.

Lalancette, Louis-Marie. Fish trap having a cardioidal structure. 4,411,092., Cl. 43-100.000.

Lamkewitz, Falk, to Webasto-Werk W. Baier GmbH & Co. Controller for the operation of heaters. 4,411,385., Cl. 237-2.00A.

Lampkin, Curtis M.: *See*—
Jordan, John F.; and Lampkin, Curtis M., 4,412,091., Cl. 136-258.000.

Landa, Benzion; and Charlap, E. Paul, to Savin Corporation. Method of increasing the density of liquid-developed gap-transferred electrophotographic images and developing composition for use therein. 4,411,976., Cl. 430-114.000.

Lang, Frank B., to RCA Corporation. Television receiver high voltage protection circuit. 4,412,254., Cl. 358-243.000.

Lang, Gerard: *See*—
Jacquet, Bernard; Lang, Gerard; Malaval, Alain; Forestier, Serge; and Le Trung, Do, 4,411,884., Cl. 424-47.000.

Lang, Walter H.; Muchel, Franz; Schulz, Kurt; and Summerer, Gunther, to Carl Zeiss-Stiftung. Ophthalmological instrument for examination of anterior and posterior portions of the eye. 4,411,502., Cl. 351-206.000.

Langer, Heimo J.: *See*—
Gruber, Bruce A.; Koch, Diether; Langer, Heimo J.; and Dunnavant, William R., 4,412,088., Cl. 585-23.000.

Lanham, Joseph S.; and Bruckner, Neal R., to Hoover Universal, Inc. Joint for securing a tubular member to a support member. 4,411,552., Cl. 403-388.000.

Lansdell, Derek A.: *See*—
Jefferson, Keith A.; and Lansdell, Derek A., 4,412,158., Cl. 318-257.000.

Laridon, Urbain L.; Kokelenberg, Hendrik E.; and Samijn, Rafael P., to AGFA-Gevaert N.V. Photoresist materials and processes of using with photosensitive naphthoquinone diazides and nitrones. 4,411,978., Cl. 430-157.000.

Larkin, Joseph F.; and Hodge, Malcolm H., to TRW Inc. Connector assembly with elastomeric sealing membranes having slits. 4,411,491., Cl. 350-96.210.

Lattmann, Werner; and Moser, Robert, to Riter Machine Works, Ltd. Apparatus and method for separating opened end flocks from a transporting air stream. 4,411,562., Cl. 406-157.000.

Lauchenauer, Alfred E., to Adnovum AG. Reactable reagents with substrates. 4,411,663., Cl. 8-107.000.

Laughon, Thomas C.; and Philpott, Michael I., to Texas Instruments Incorporated. Electronic learning aid with picture book. 4,411,628., Cl. 434-169.000.

Laukien, Gunther R. Twin-hull watercraft. 4,411,213., Cl. 114-312.000.

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LaVanture, Mark D.; and Walker, George L., to Mobil Oil Corporation. Clarification of black phosphoric acid with phosphoric acid rinse water. 4,411,811., Cl. 252-182.000.

Lawrence, Victor B.: *See*—
Gersho, Allen; Ho, Edmond Y.; Gitlin, Richard D.; Lawrence, Victor B.; and Lim, Tong L., 4,412,341., Cl. 375-102.000.

Leblanc, Raymond F.; and Cummins, William T., to Teledyne Industries, Inc. Barge bumper construction. 4,411,556., Cl. 405-213.000.

Lechevallier, Christian, to Institut de Recherches de la Siderurgie Francaise. Metallurgical container for the inductive treatment of metal. 4,411,412., Cl. 266-242.000.

LeClair, Francis J.; and Surgant, John M., to Monsanto Company. Flowable herbicides. 4,411,692., Cl. 71-93.000.

LeClair, Francis J.; and Surgant, John M., to Monsanto Company. Flowable herbicides. 4,411,693., Cl. 71-118.000.

Leclercq, Joseph; Le Pargneux, Jacques; Feutrel, Claude; Lestiboudois, Guy; and Chantant, Michel, to Commissariat a l'Energie Atomique. Spacer grating for fuel element in a nuclear reactor. 4,411,862., Cl. 376-442.000.

Lee, John K. Master cylinder internal combustion engine. 4,411,230., Cl. 123-198.00F.

Lee, Kenneth S. Passive thermal storage wall structures for heating and cooling buildings. 4,411,255., Cl. 126-429.000.

Lee, Minyoung; Reed, William R., Jr.; and Szala, Lawrence E., to General Electric Company. Self-lubricating cutting tool and method. 4,411,566., Cl. 407-119.000.

Lee, Otha C.: *See*—
Brown, Wallace G.; and Lee, Otha C., 4,412,101., Cl. 179-7.10R.

Lee, Sung K., to SCA Services, Inc. Detoxification of spent antimony halide catalyst and recovery of antimony values. 4,411,874., Cl. 423-87.000.

Le Gars, Jacques: *See*—
Kerforne, Jean-Francois; Le Gars, Jacques; and Remery, Michel, 4,412,284., Cl. 364-200.000.

Leger, Alfred R.: *See*—
Starvaski, Raymond R.; and Leger, Alfred R., 4,411,394., Cl. 242-83.000.

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Bustos, Rafael T., 4,411,367., Cl. 211-187.000.

Le Goff, Andre: *See*—
Thibault, Bernard; and Le Goff, Andre, 4,411,354., Cl. 198-472.000.

Lehman, Manfred: *See*—
Schroeder, Eberhard, deceased; Lehman, Manfred; and Rufer, Clemens, 4,411,910., Cl. 424-279.000.

Lehmann, Hans-Dieter; Krisam, Gerd G.; and Golla, Ruth S., to Gambro Dialysatoren KG. Method of binding a biologically active material to a carrier containing hydroxyl groups. 4,412,000., Cl. 435-179.000.

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Northup, John D., 4,411,681., Cl. 65-77.000.

Leithauser, Douglas R.; and Young, John K., to Union Carbide Corporation. Neck tube closure assembly for cryogenic containers. 4,411,138., Cl. 62-50.000.

Lenack, Alain L. P.: *See*—
Tirtiaux, Robert; and Lenack, Alain L. P., 4,411,806., Cl. 252-49.600.

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Leclercq, Joseph; Le Pargneux, Jacques; Feutrel, Claude; Lestiboudois, Guy; and Chantant, Michel, 4,411,862., Cl. 376-442.000.

Lesher, George Y.; and Singh, Baldev, to Sterling Drug Inc. Process for preparing 5-(lLower-alkanoyl)-6-(lower-alkyl)-2(1H)-pyridinone. 4,412,077., Cl. 546-298.000.

Lesieur, Jean-Paul, to Compagnie Internationale pour l'Informatique Cii Honeywell Bull. Method and arrangement for magnetic digital recording with high frequency biasing. 4,412,257., Cl. 360-45.000.

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Lestiboudois, Guy: *See*—
Leclercq, Joseph; Le Pargneux, Jacques; Feutrel, Claude; Lestiboudois, Guy; and Chantant, Michel, 4,411,862., Cl. 376-442.000.

Le Trung, Do: *See*—
Jacquet, Bernard; Lang, Gerard; Malaval, Alain; Forestier, Serge; and Le Trung, Do, 4,411,884., Cl. 424-47.000.

Levine, Peter A., to RCA Corporation. Apparatus for processing CCD output signals. 4,412,190., Cl. 333-165.000.

Leviton Manufacturing Company, Inc.: *See*—
Bienwald, Wolfgang F.; and Tumsuden, Herbert W., Jr., 4,412,193., Cl. 335-18.000.

Lew, Hyok S. Angular belt valve for manifold control. 4,411,291., Cl. 137-624.150.

Lewis, Alfred H. Sclerometer. 4,411,153., Cl. 73-79.000.

Lewis, Frederick M., to Sterling Drug Inc. Process for utilizing low calorific value off-gases and simultaneous deodorization thereof. 4,411,203., Cl. 110-341.000.

Lewis, George E., to Hydril Company. Fluid sealing assembly for a marine riser telescopic slip joint. 4,411,434., Cl. 277-27.000.

Lewis, Leon L.; and Murray, Michael V., to United States Steel Corporation. Can-making method. 4,411,145., Cl. 72-42.000.

Lewy, Laury P. Neck rest for shampoo bowls. 4,411,032., Cl. 4-523.000.

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Froitzheim, Hermann, 4,412,131., Cl. 250-305.000.

LIBA Maschinenfabrik GmbH: *See*—
Boehm, Alfred; and Richter, Eberhard, 4,411,392., Cl. 242-35.50R.

Liburdy, Robert P. Magnetic resonance chromatography. 4,411,789., Cl. 210-635.000.

Licentia Patent-Verwaltungs-GmbH: *See*—
Schuster, Harald, 4,412,352., Cl. 455-319.000.

Lidow, Alexander: *See*—
Herman, Thomas; and Lidow, Alexander, 4,412,242., Cl. 357-52.000.

Liebig, Heinrich. Bore undercutting tool. 4,411,324., Cl. 175-289.000.

Liedtke, Ronald: *See*—
Birdsall, John D.; Liedtke, Ronald; and Smollar, Marvin, 4,411,098., Cl. 46-206.000.

Liggett Group Inc.: *See*—
Hall, Floyd V., 4,411,640., Cl. 493-45.000.

Light, Kenneth K.; McGhie, Joseph A.; Fujioka, Futoshi; and Yoshida, Takao, to International Flavors & Fragrances Inc. Bridged tricyclic alcohol, process for preparing same and perfumery use thereof. 4,411,830., Cl. 252-522.00R.

Light, Kenneth K.; Schreiber, William L.; McGhie, Joseph A.; Schreck, Ronald P.; Yoshida, Takao; Schreiber, Loren B.; and Muralidhara, Ranya, to International Flavors & Fragrances Inc. Process for producing solanone, norsolanadione and intermediates therefor. 4,412,083., Cl. 564-279.000.

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Dubois, Gilles; and Hulin, Jean P., 4,411,130., Cl. 57-352.000.

Lim, Tong L.: *See*—
Gersho, Allen; Ho, Edmond Y.; Gitlin, Richard D.; Lawrence, Victor B.; and Lim, Tong L., 4,412,341., Cl. 375-102.000.

Limb, John O., to Bell Telephone Laboratories, Inc. Collision avoiding system, apparatus and protocol for a multiple access digital communications system including variable length packets. 4,412,326., Cl. 370-85.000.

Lindahl, George R., III; and Henrick, Clive A., to Zoecon Corporation. α-Cyano-β-(trisubstituted phenylhydrazino)-n-ethoxycarbonylacrylamides. 4,411,839., Cl. 260-465.00D.

Lindberg, Frank A., to Westinghouse Electric Corp. Apparatus and method for tape bonding and testing of integrated circuit chips. 4,411,719., Cl. 156-64.000.

Linger, Barry A., to Howard Machinery Limited. Cultivating machine rotor. 4,411,322., Cl. 172-540.000.

Linton, Charles R.: *See*—
Crider, Chester H.; and Linton, Charles R., 4,412,166., Cl. 318-696.000.

Lintz, Peter: *See*—
Sander, Bruno; Hess, Klaus; Lintz, Peter; and Goesele, Walter, 4,411,797., Cl. 210-727.000.

Linzmeier, Wilhelm: *See*—
Glasauer, Rudolf; Duschl, Bernhard; Linzmeier, Wilhelm; and Schaffrik, Arnold, 4,412,201., Cl. 336-192.000.

Lion Corporation: *See*—
Ando, Hideo; Hayashi, Akira; and Kitano, Kyozo, 4,411,815., Cl. 252-353.000.

Lipcon, Jesse B., to Digital Equipment Corporation. Precision setting of currents and reference voltages. 4,412,347., Cl. 455-58.000.

Liquid Level Lectronics, Inc.: *See*—
Johnson, J. Wallace; and Hye, A. B. M. Abdul, 4,411,313., Cl. 166-90.000.

List, Hans: *See*—
Feichtinger, Gerhard, 4,411,227., Cl. 123-196.00R.

Ljung, Bo Hans G.: *See*—
Gamertsfelder, George R.; and Ljung, Bo Hans G., 4,411,527., Cl. 356-350.000.

Lloyd, Norman E., to Nabisco Brands, Inc. Process for isomerizing glucose. 4,411,996., Cl. 435-94.000.

Lloyd, Ronald B.: *See*—
Morris, Richard L.; and Lloyd, Ronald B., 4,411,844., Cl. 261-34.00R.

Lockery, Harry E.; and Laimins, Eric, to Hottinger Baldwin Measurements, Inc. Apparatus for applying a load to a strain gage transducer beam. 4,411,327., Cl. 177-211.000.

Loffelman, Frank F.; and Hoffman, Joseph A., to American Cyanamid Company. Novel light stabilizers for polymers. 4,412,020., Cl. 524-100.000.

Loftus, Jordan; and Woldy, Paul N., to Texaco Inc. System for messuring temperature of hot gases laden with entrained solids. 4,411,533., Cl. 374-125.000.

Lohmann GmbH & Co. KG: *See*—
Blaudszun, Bernd, 4,411,075., Cl. 34-32.000.

Lohse, Friedrich: *See*—
Monnier, Charles E.; and Lohse, Friedrich, 4,412,047., Cl. 525-507.000.

Loose Leaf Metals Company, Inc.: *See*—
Gallman, Joseph L., 4,411,544., Cl. 402-69.000.

Lott, John W.: *See*—
Haney, Douglas M.; and Lott, John W., 4,411,980., Cl. 430-291.000.

Louis, Jacques; and Gauthier, Jean, to La Rochette-Cenpa. Conveyor apparatus for the transportation of plates, strips or sheets of material on continuous belts. 4,411,420., Cl. 271-276.000.

Lovelace, Ralph: *See*—
Boyum, George A.; Renner, Robert A.; and Lovelace, Ralph, 4,411,070., Cl. 30-379.500.

Lovewell, Jack S.: *See*—
Fogarty, Bonnie R.; Fogarty, A. Edward; Nowak, Ralph; and Lovewell, Jack S., 4,411,249., Cl. 124-64.000.

Low, Philip F.; Roth, Charles B.; and Stucki, Joseph W., to Purdue Research Foundation. System and method for rapid beneficiation of Bentonite clay. 4,411,530., Cl. 366-4.000.

Lowder, Marlene; and Johnson, Norman B., to Lowder, Marlene. Bottle dispensing and control system. 4,411,351., Cl. 194-4.00C.

Lowe, Henry E. Odor testing apparatus. 4,411,156., Cl. 73-432.00R.

Lowry, Joseph M.; and Griffin, Ernest E. Carriage for a grass trimming device. 4,411,126., Cl. 56-17.500.

LST Corporation: *See*—
St. Aubin, William R., 4,411,104., Cl. 49-470.000.

Lu, Chin H.; Au Clair, Christopher J.; and Erhardt, Peter F., to Xerox Corporation. Ortho-halo phenyl carboxylic acid charge enhancing additives. 4,411,974., Cl. 430-106.000.

Lu, Chin H.; and Au Clair, Christopher J., to Xerox Corporation. Para-halo phenyl carboxylic acid charge enhancing additives. 4,411,975., Cl. 430-106.000.

Lucarelli, Frank J. Invalid walker. 4,411,283., Cl. 135-67.000.

Lucas, Pierre M.: *See*—
Glowinsky, Albert; and Lucas, Pierre M., 4,412,324., Cl. 370-58.000.

Lumma, William C., Jr.: *See*—
Baldwin, John J.; and Lumma, William C., Jr., 4,411,899., Cl. 424-246.000.

Lummus Company, The: *See*—
Unger, Harold; Sze, Morgan C.; and Van Drieses, Roger P., 4,411,768., Cl. 208-59.000.

Lundberg, Robert D.; Phillips, Robert R.; and McDougall, Lee A., to Exxon Research and Engineering Co. Conversion of polymer solutions into solids or more viscous solution. 4,412,028., Cl. 524-364.000.

Lundstrom, Stephen F.: *See*—
Barnes, George H.; Lundstrom, Stephen F.; and Shafer, Philip E., 4,412,303., Cl. 364-900.000.

Lustgarten, Stewart J.; and Engelbrecht, Jurgen. Dental filler material containing zeolite for dental composite and method of manufacture. 4,412,015., Cl. 523-116.000.

Lutenegger, Alan J.; and Pitt, John M., to Iowa State University Research Foundation, Inc. Vane modulus soil tester. 4,411,160., Cl. 73-843.000.

M/A-COM DCC, Inc.: *See*—
Chapman, Lynn C., 4,412,331., Cl. 372-29.000.

M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Wurtinger, Horst; Glissmann, Jochen; and Heissler, Herbert, 4,411,114., Cl. 52-309.100.

M & T Chemicals Inc.: *See*—
Berger, Abe, 4,412,078., Cl. 548-110.000.

Maa, Jer-shen, to RCA Corporation. Etching of tantalum silicide/-doped polysilicon structures. 4,411,734., Cl. 156-643.000.

Machida Endoscope Co., Ltd.: *See*—
Machida, Masashi, 4,411,257., Cl. 128-6.000.

Machida, Masashi, to Machida Endoscope Co., Ltd. Inspection endoscope. 4,411,257., Cl. 128-6.000.

Mack, Mark P.: *See*—
Berge, Charles T.; and Mack, Mark P., 4,412,065., Cl. 528-26.000.

Macklin, John J.; Silfvast, William T.; and Wood, Obert R., II, to Bell Telephone Laboratories, Incorporated. SPER Device for material working. 4,411,733., Cl. 156-643.000.

Maddox, Harry L.: *See*—
Fox, William B.; and Maddox, Harry L., 4,412,327., Cl. 371-21.000.

Madonia, Ciro; Hatzikelis, Christopher; and Cosentino, Cesare C. Multi-groove trim. 4,411,938., Cl. 428-31.000.

Mager, Sue A.: *See*—
Poppe, Wassily; Craddock, Charles F.; Gutekunst, Robert W.; Ladd, Robert G.; and Mager, Sue A., 4,411,610., Cl. 425-174.400.

Magidson, Mark, to Moldex/Metric Products, Inc. Combined chest piece and shoulder pad. 4,411,025., Cl. 2-97.000.

Magna Technologies, Inc.: *See*—
Franco, Gino, 4,411,359., Cl. 206-217.000.

Magnetic Peripherals Inc.: *See*—
Stricklin, John D.; Denero, Anthony D.; Quatro, Robert A.; and Duff, James A., 4,412,260., Cl. 360-97.000.

Maier, Alexander G.: *See*—
Brisken, Thomas A.; and Maier, Alexander G., 4,411,715., Cl. 148-131.000.

Maillard, Laurent; and Bregolin, Graziano, to Thermosystem S.p.A. Multiple-use channel-shaped structure for suspended ceiling. 4,411,116., Cl. 52-489.000.

Makimoto, Mitsuo: *See*—
Onishi, Hiroshi; Yamashita, Sadahiko; and Makimoto, Mitsuo, 4,412,351., Cl. 455-317.000.

Makinen, Eero; and Gordin, Stefan, to Oy Wartsila Ab. Propeller guard. 4,411,631., Cl. 440-72.000.

Makino, Yoshio; Murata, Yoshihiko; Kakinuma, Toshiaki; Yamaguchi, Masaharu; and Fujisawa, Naoyuki, to Mitsubishi Mining & Cement Company Ltd.; Mitsubishi Cement Asbestos Company Ltd.; and Toray Silicone Company Ltd. Method for sheet forming a gypsum hardened body. 4,411,702., Cl. 106-111.000.

Maksim, John, Jr. Burners for soaking pit furnaces. 4,411,617., Cl. 431-187.000.

Malaval, Alain: *See*—
Jacquet, Bernard; Lang, Gerard; Malaval, Alain; Forestier, Serge; and Le Trung, Do, 4,411,884., Cl. 424-47.000.

Male, Alan T.: *See*—
Braginski, Aleksander I.; and Male, Alan T., 4,411,959., Cl. 428-558.000.

Mallon, Joseph R.: *See*—
Kurtz, Anthony D.; and Mallon, Joseph R., 4,412,203., Cl. 338-4.000.

Malloy, Thomas P.: *See*—
Lester, George W.; and Malloy, Thomas P., 4,411,802., Cl. 252-8.55D.

Malow, Egon: *See*—
Ulrich, Michael; Trautmann, Manfred; Heck, Gunter; and Malow, Egon, 4,411,846., Cl. 261-98.000.

Manaka, Toshio: *See*—
Atago, Takeshi; and Manaka, Toshio, 4,411,232., Cl. 123-438.000.

Mangiarotti, Luigi: *See*—
Cimino, Andrea; Plicchi, Gianni; Mangiarotti, Luigi; Rossi, Maurizio; Betti, Vittorio; Spighi, Massimo; and Zingaretti, Gabriele, 4,411,918., Cl. 426-124.000.

Maniwa, Hideyo: *See*—
Otsuka, Masasuke; Maniwa, Hideyo; and Nishina, Shinya, 4,411,863., Cl. 420-580.000.

Manjot, Roger. Safety system for hydraulically controlled hoisting apparatus. 4,411,368., Cl. 212-149.000.

Mann, Donald B. High-lead yarder rake. 4,411,080., Cl. 37-117.000.

Mann, George V., to Vanderbilt University. Method of producing milk factor. 4,411,916., Cl. 426-43.000.

Mannesmann Aktiengesellschaft: *See*—
Vogelgesang, Herbert, 4,411,170., Cl. 74-661.000.

Mansfeld, Manfred; and Wenderoth, Karl, to Triumph-Adler A.G. fur Buro-und Informationstechnik. Ribbon feed and elevating mechanism for typewriters or similar machines. 4,411,541., Cl. 400-213.000.

Manteufel, Dale A.: *See*—
Ellingsen, Raymond L.; and Manteufel, Dale A., 4,411,298., Cl. 144-193.00A.

Marancik, William G., to Airco, Inc. Method of manufacture of multifilamentary intermetallic superconductors. 4,411,712., Cl. 148-11.50Q.

Marano, Vincent, III: *See*—
Pervier, James W.; Vines, Harvey L.; Marano, Vincent, III; and Patterson, Michael A., 4,411,677., Cl. 62-25.000.

Marcheix, Raymond; and Desiage, Christian, to Regie Nationale des Usines Renault. Mounting for a fuel tank of synthetic material. 4,411,441., Cl. 280-5.00A.

Marconi Company Limited, The: *See*—
Briggs, John N., 4,412,219., Cl. 343-6.80R.
Gerard, Roger E. J., 4,412,185., Cl. 330-149.000.

Marcovici, Mitch, to Keuffel & Esser Company. Precise linear actuator. 4,411,166., Cl. 74-89.000.

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Jones, David A., deceased, 4,411,184., Cl. 84-1.030.
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Mathis, Ronald D.: *See—*
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Matsumoto, Kent E.: *See—*
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Matsumoto, Takao; Fujimaki, Atsushi; and Nagata, Takeo, to Showa Oil Company, Ltd. Suppressing method of iso-citric acid formation in producing citric acid from hydrocarbons by fermentation. 4,411,998., Cl. 435-144.000.
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Matsushita Electric Industrial Co., Ltd.: *See—*
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Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; and Wakabayashi, Takeshi, to Electric Power Development Co.; and Kawasaki Kabushiki Kaisha. Method for liquefying low rank coal. 4,411,765., Cl. 208-8.0LE.
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Maurel, Vincent: *See—*
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Gee, Minor E., 4,411,642., Cl. 493-125.000.
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Mayer, Linda J.: *See—*
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Maynarez, Franklin D., to Coulter Electronics, Inc. Debris alarm. 4,412,175., Cl. 324-71.100.
Mazgaj, Robert M.: *See—*
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McCarty, Patrick R., to AMP Incorporated. Electrical switch and actuating mechanism therefor. 4,412,108., Cl. 200-5.00R.
McComb, Ronald J., to Youngstown Steel Door Company, The. Pneumatic hopper discharge outlet. 4,411,560., Cl. 406-128.000.
McCombie, Stuart W.: *See—*
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McConnell, Frank G., III Fluid treatment system. 4,411,779., Cl. 210-108.000.
McCoy, David R.; Cuscurida, Michael; and Speranza, George P., to Texaco Inc. Demulsification of bitumen emulsions using water soluble epoxy-containing polyethers. 4,411,775., Cl. 208-188.000.
McCoy, Kenneth H.; and Romain, John, to Romain, John. Multi-purpose exercise implement. 4,411,426., Cl. 272-126.000.
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Close, Albert R.; and Oster, Winton, 4,411,069., Cl. 30-276.000.
McDole, Lawrence K., to Brockway Glass Co., Inc. Glassware transfer. 4,411,353., Cl. 198-425.000.
McDonald, Richard L. C., to U.S. Philips Corporation. Automatic brightness control circuit for a high voltage electrical power supply. 4,412,128., Cl. 250-213.0VT.
McDougall, Lee A.: *See—*
Lundberg, Robert D.; Phillips, Robert R.; and McDougall, Lee A., 4,412,028., Cl. 524-364.000.
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McGrew, Steve P. System for synthesizing strip-multiplexed holograms. 4,411,489., Cl. 350-3.760.

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McInnis, Patrick M.: *See*—
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McKay, Dwight L., to Phillips Petroleum Company. Producing increased yield of hydrogen by cracking petroleum with potassium-containing catalyst. 4,411,777., Cl. 208-120.000.

McKnight, James K.: *See*—
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McLellan, Edward J. Three-electrode low pressure discharge apparatus and method for uniform ionization of gaseous media. 4,412,333., Cl. 372-87.000.

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McWithey, Robert R.; Royster, Dick M.; and Bales, Thomas T., to United States of America, National Aeronautics and Space Administration. Metal matrix composite structural panel construction. 4,411,380., Cl. 228-181.000.

Mead Corporation, The: *See*—
Wishart, John G., 4,411,721., Cl. 156-73.100.

Mead Johnson & Company: *See*—
Temple, Davis L., Jr.; and Yevich, Joseph P., 4,411,901., Cl. 424-250.000.

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Cox, James A., 4,411,268., Cl. 128-421.000.
Dickhudt, Eugene A.; and Paulson, Roger A., 4,411,276., Cl. 128-784.000.
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Mehta, Avinash C., to Polaroid Corporation. Linear polymers from blocked vinyl biphenyl compounds. 4,412,050., Cl. 526-266.000.

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Melin, Thomas: *See*—
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Menser, Howard K., to Miply Equipment Inc. Pressure saturator. 4,411,216., Cl. 118-117.000.

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McAleer, William J.; Bailey, Fred J.; and Markus, Henry Z., 4,412,002., Cl. 435-237.000.

Meredith, Douglas; and Cronin, James A., to British Steel Corporation. Transfer printing metal sheet coated with thermoset layer while still hot from curing. 4,411,667., Cl. 8-471.000.

Meredith, Richard L., to Reliance Electric Company. Control system for variable speed belt drives. 4,411,590., Cl. 415-26.000.

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Cassinelli, Giuseppe; Grein, Arpad; Merli, Sergio; and Rivola, Giovanni, 4,411,834., Cl. 260-365.000.

Meserol, Peter M.; and Acker, Jesse L., to Gamma Biologicals, Inc. Apparatus for use in qualitative determination of immunological reactions. 4,411,518., Cl. 356-39.000.

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Meyer, Daniel: *See*—
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Meyer, Jacques; and Bernelin, Daniel, to Chloe Chimie. Cross-linkable saturated powderous compositions and powderous painting and coating compositions containing same. 4,412,034., Cl. 524-791.000.

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Miccoli, Franco; and Corda, Giuseppe, to SGS-Ates Componenti Elettronici S.p.A. Storage cell for nonvolatile electrically alterable memory. 4,412,311., Cl. 365-185.000.

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Micko, Richard E.: *See*—
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Middleton, Harold G., to Advanced Fuel Systems. Fuel system for internal combustion engine. 4,411,234., Cl. 123-485.000.

Midwest Research Institute: *See*—
Grow, Ann E., 4,411,989., Cl. 435-20.000.

Miedema, Hotze, to Bell Telephone Laboratories, Incorporated. Method and apparatus for distinguishing between minimum and non-minimum phase fades. 4,412,350., Cl. 455-306.000.

Mietzsch, Fritz: *See*—
Alberts, Heinrich; Friemann, Hans; Moretto, Hans-Heinrich; Sattlegger, Hans; and Mietzsch, Fritz, 4,412,039., Cl. 525-106.000.

Mihara, Toshio: *See*—
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Mikeska, Felix: *See*—
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Miksitz, Frank J., to UFI Engineering & Manufacturing Co., Inc. Spiral scoop rotary plow feeder. 4,411,377., Cl. 222-342.000.

Mile-Age Research Corporation: *See*—
Curtis, Nikolaus A.; and Karner, James E., 4,411,229., Cl. 123-198.00F.

Miller, Anton J., to Bell Telephone Laboratories, Incorporated. Method of contouring crystal plates. 4,411,731., Cl. 156-630.000.

Miller, Don W.: *See*—
Schlosser, Philip A.; and Miller, Don W., 4,411,059., Cl. 29-572.000.

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Miller, Jack V. Seasonal control skylight glazing panel with passive solar energy switching. 4,411,493., Cl. 350-262.000.

Miller, Laurence L., to TRW, Inc. Gerotor gear set device with integral rotor and commutator. 4,411,606., Cl. 418-61.00B.

Miller, Mark C., to Perkin-Elmer Corporation, The. Sample transfer vessel. 4,411,575., Cl. 414-217.000.

Miller, Richard L. Method of laying brick for swimming pool patios and the like. 4,411,119., Cl. 52-747.000.

Miller, Thomas G.; and Polk, Robert G., to United States of America, Army. Device for seeing through battlefield smokes and aerosols. 4,411,487., Cl. 350-1.100.

Miller, Thomas M. Furnace wall construction. 4,411,621., Cl. 432-247.000.

Miller, Wendell E., to Scott and Fetzer Company, The. Fluid flow controlling device. 4,411,189., Cl. 91-420.000.

Milnar, James B. Bench press safety rest. 4,411,425., Cl. 272-123.000.

Mima, Hiroshi, to Murata Kikai Kabushiki Kaisha. Method and apparatus for splicing spun yarns. 4,411,128., Cl. 57-22.000.

Minezaki, Shigehiro, to Sharp Kabushiki Kaisha. Method for forming a pattern in a thin-film transistor having tellurium semiconductor layer. 4,411,981., Cl. 430-299.000.

Mining & Chemical Products Limited: *See*—
Butler, Richard A., 4,411,615., Cl. 425-591.000.

Ministry of International Trade & Industry: *See*—
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Minnesota Mining and Manufacturing Company: *See*—
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Johnson, Dee L.; Senta, Therese A.; and Sirvio, Larry M., 4,411,893., Cl. 424-181.000.
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Matsuda, Motonobu; and Tanaka, Yoshihiro, 4,412,234., Cl. 357-17.000.
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Miply Equipment Inc.: *See*—
Menser, Howard K., 4,411,216., Cl. 118-117.000.

Mitchell, Daniel M., to Rockwell International Corporation. AC-DC Converter having an improved power factor. 4,412,277., Cl. 363-81.000.

Mito, Michio: *See*—
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Mitsubishi Adetate Co. Ltd.: *See*—
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Mitsubishi Cement Asbestos Conpany Ltd.: *See*—
Makino, Yoshio; Murata, Yoshihiko; Kakinuma, Toshiaki; Yamaguchi, Masaharu; and Fujisawa, Naoyuki, 4,411,702., Cl. 106-111.000.

Mitsubishi Denki Kabushiki Kaisha: *See*—
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Inoue, Takeo; and Shirazawa, Takashi, 4,411,457., Cl. 285-52.000.
Ishii, Isao; Murakami, Tadaki; Sakamoto, Yoshiaki; Utsumi, Yoshikazu; Nakamura, Tatsuharu; and Takayanagi, Hiroshi, 4,412,010., Cl. 501-153.000.
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Mitsubishi Denki Kabushiki Kaisha LSI Development Laboratory: *See*—
Sato, Shinichi; Harada, Hiroshi; Fukumoto, Takaaki; Takano, Hirozo; Kotani, Hideo; and Kayano, Shinpei, 4,411,929., Cl. 427-38.000.
Mitsubishi Jukogyo kabushiki Kaisha: *See*—
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Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
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Mitsubishi Mining & Cement Company Ltd.: *See*—
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Mitsubishi Petrochemical Co., Ltd.: *See*—
Kihara, Kunio; Toda, Hideo; Mori, Motokuni; and Sato, Koji, 4,412,011., Cl. 521-38.000.
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Mitsubishi Rayon Company Ltd.: *See*—
Nakazima, Atushi; and Edamatu, Mitisuke, 4,411,930., Cl. 427-54.100.
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Mitsubishi Yuka Pharmaceutical Co., Ltd.: *See*—
Kihara, Kunio; Toda, Hideo; Mori, Motokuni; and Sato, Koji, 4,412,011., Cl. 521-38.000.
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Netting, David I.; Spivack, Bruce D.; and Cunnion, James P., Jr., to PQ Corporation. Process for surface modified hollow microspheres. 4,411,847., Cl. 264-7.000.

Neumann, Ernst-Georg, to Didier-Werke AG. Apparatus for burning of fuel gases and process for avoidance of combustion chamber oscillations. 4,411,616., Cl. 431-114.000.

New England Nuclear Corporation: *See*—
Tzodikov, Nathan R., 4,411,881., Cl. 424-1.100.

Newcomb, James S.; and Eumurian, Charles, to Control Data Corporation. Optical displacement and contour measuring. 4,411,528., Cl. 356-375.000.

Newnham, Robert E.: *See*—
Klicker, Kenneth A.; Newnham, Robert E.; Cross, Leslie E.; and Biggers, James V., 4,412,148., Cl. 310-358.000.

Nickel, Andreas; Reissinger, Karl H.; Brandt, Hans-Walther; and Melin, Thomas, to Bayer Aktiengesellschaft. Packing for technical processes. 4,411,942., Cl. 428-137.000.

Nickel, Horst: *See*—
Wild, Peter; and Nickel, Horst, 4,411,669., Cl. 8-654.000.

Nicolaus, Frank G., to Bally Manufacturing Corporation. Repositioning mechanism for game reels. 4,411,428., Cl. 273-143.00R.

Niemeier, Byron M.: *See*—
Wedertz, Larry D.; Ross, Oakley G.; and Niemeier, Byron M., 4,411,398., Cl. 244-3.280.

Niemeier, Gerd: *See*—
Ableitner, Erich; Conrad, Ulrich; Derndinger, Hans-Otto; and Niemeier, Gerd, 4,411,237., Cl. 123-501.000.

Niewold, Donald W. Truck auger-hopper constructions. 4,411,581., Cl. 414-489.000.

Nifco Inc.: *See*—
Kimura, Shigeru, 4,411,788., Cl. 210-439.000.

Nihon Plast Co., Ltd.: *See*—
Hanada, Hidekazu, 4,411,331., Cl. 180-78.000.

Niino, Masahiko, to Yamada Electric Manufacturing Company Ltd. AC Electrical device protective thermal relay. 4,412,266., Cl. 361-24.000.

Niiro, Yasuhiko: *See*—
Mochizuki, Kiyofumi; Wakabayashi, Hiroharu; and Niiro, Yasuhiko, 4,411,520., Cl. 356-73.100.

Niitsu, Shigeo, to Nippon Electric Co., Ltd. Remote control signal transmitter capable of setting custom codes individually alloted to a plurality of controlled instruments. 4,412,218., Cl. 340-825.560.

Niki, Akira, to Nagoya Kiko Kabushiki Kaisha. Loading apparatus. 4,411,587., Cl. 414-752.000.

Ninomiya, Youichi; and Tsuno, Kazuhiko, to Asahi Yukizai Kogyo Co., Ltd. Ball valve assembly. 4,411,407., Cl. 251-315.000.

Nipon Sangyo Kikai Kabushiki Kaisha: *See*—
Suzuki, Kensuke; and Okada, Sunao, 4,411,780., Cl. 210-150.000.

Nippon Cable System, Inc.: *See*—
Yoshifuji, Junnosuke, 4,411,168., Cl. 74-501.00R.

Nippon Electric Co., Ltd.: *See*—
Arai, Motohiro, 4,411,678., Cl. 65-3.120.
Niitsu, Shigeo, 4,412,218., Cl. 340-825.560.

Nippon Kogaku K.K.: *See*—
Muryoi, Takeshi, 4,411,498., Cl. 350-429.000.
Ogino, Makoto; Fujiu, Takamitsu; Kariya, Michio; and Ichimura, Takeo, 4,411,624., Cl. 433-173.000.

Nippon Kokan Kabushiki Kaisha: *See*—
Hara, Tomihiro; Ogawa, Masahiro; Tsukada, Masakazu; and Yamashita, Masaaki, 4,411,964., Cl. 428-626.000.
Miyamoto, Akira; Ishikawa, Masaru; Nishi, Masaaki; Ishizawa, Kenki; and Shiranita, Akira, 4,412,008., Cl. 501-97.000.

Nippon Oil Company, Limited: *See*—
Matsuura, Kazuo; Yamaoka, Noboru; and Miyoshi, Mituji, 4,412,042., Cl. 525-260.000.

Nippon Soken, Inc.: *See*—
Igashira, Toshihiko; Tanaka, Takeshi; Sekiguchi, Kiyonori; and Yanagihara, Hiromichi, 4,411,242., Cl. 123-569.000.

Nippon Steel Corporation: *See*—
Nakashima, Hiroyuki; Sumida, Morihiro; and Goto, Hiroki, 4,411,696., Cl. 75-51.000.

Nippon Telecommunication Eng. Co.: *See*—
Asano, Kiyomitsu; Kondo, Toshikatsu; and Mizuno, Shigeru, 4,411,538., Cl. 400-124.000.

Nippon Telegraph & Telephone: *See*—
Ogawa, Seiki; Mito, Michio; and Shinoi, Tsuyoshi, 4,412,102., Cl. 179-99.00M.

Nippon Telegraph & Telephone Public Corporation: *See*—
Akazawa, Yukio; Matsuya, Yasuyuki; and Iwata, Atsushi, 4,412,208., Cl. 340-347.0DA.

Nippon Tsushin Kogyo Kabushiki Kaisha: *See*—
Ogawa, Seiki; Mito, Michio; and Shinoi, Tsuyoshi, 4,412,102., Cl. 179-99.00M.

Nippon Zeon Co., Ltd.: *See*—
Kitahara, Shizuo; Hirokawa, Yoshitsugu; Kawada, Haruki; Fujii, Toshihiro; Sugi, Nagatoshi; Hasegawa, Hiroaki; and Yoshioka, Akira, 4,412,031., Cl. 524-526.000.
Kitahara, Shizuo; Hirokawa, Yoshitsugu; Kawada, Haruki; Fujii, Toshihiro; Sugi, Nagatoshi; Hasegawa, Hiroaki; and Yoshioka, Akira, 4,412,041., Cl. 525-154.000.

Nippondenso Co., Ltd.: *See*—
Kojima, Akira; and Sakai, Toshiyasu, 4,412,160., Cl. 318-280.000.
Kunita, Shizuo; Akimoto, Osamu; Sugie, Osamu; Iyoda, Michio; and Suzuki, Kazuo, 4,411,247., Cl. 123-655.000.
Tanahashi, Toshio; Sumitani, Sinya; Matuura, Takeo; Ichikawa, Shinji; and Okuno, Takao, 4,411,845., Cl. 261-65.000.

Tanaka, Toshio; and Miwa, Katsuteru, 4,411,245., Cl. 123-609.000.
Nishi, Masaaki: *See—*
Miyamoto, Akira; Ishikawa, Masaru; Nishi, Masaaki; Ishizawa, Kenki; and Shiranita, Akira, 4,412,008., Cl. 501-97.000.
Nishibara, Hajime: *See—*
Hashizume, Shuhei; Abeta, Sadaharu; Ohmae, Tadayuki; and Nishibara, Hajime, 4,411,666., Cl. 8-455.000.
Nishida, Koji; and Kawai, Taneichi, to Aisin Seiki Kabushiki Kaisha. Embroidery frame for automatic embroidery machine. 4,411,208., Cl. 112-103.000.
Nishida, Takao; and Hirohata, Takashi, to Amchem Products, Inc. Process and composition for coating metals. 4,411,937., Cl. 427-435.000.
Nishihara, Yoshio: *See—*
Nagasawa, Toshio; and Nishihara, Yoshio, 4,412,125., Cl. 219-549.000.
Nishimura, Akio: *See—*
Sakurai, Akira; Nakanishi, Takashi; and Nishimura, Akio, 4,411,647., Cl. 604-16.000.
Nishimura, Shinichi; Akiyama, Yoshinori; and Hoshika, Yoshiaki, to Nissan Motor Co., Ltd. Supporting device of a head rest for a vehicle seat. 4,411,470., Cl. 297-410.000.
Nishina, Shinya: *See—*
Otsuka, Masasuke; Maniwa, Hideyo; and Nishina, Shinya, 4,411,863., Cl. 420-580.000.
Nishino, Takao; Yamaguchi, Toshihiro; and Tanaka, Kazunori, to Futaba Denshi Kogyo K.K. Driving circuit for a fluorescent display apparatus having fewer leads. 4,412,213., Cl. 340-753.000.
Nishiyama, Akio: *See—*
Itaba, Takeshi; Nishiyama, Akio; Kikuchi, Noribumi; Shingyoji, Takayuki; and Ohsawa, Yuzo, 4,411,763., Cl. 204-298.000.
Nissan Chemical Industries, Ltd.: *See—*
Mutsukado, Motoo; and Yamada, Shin, 4,412,082., Cl. 562-478.000.
Nissan Motor Company, Limited: *See—*
Kitamura, Hidetoshi; and Kato, Hirohisa, 4,411,154., Cl. 73-118.000.
Koike, Shoichi, 4,411,466., Cl. 296-188.000.
Matsui, Fujio; and Suzuki, Hitoshi, 4,411,236., Cl. 123-492.000.
Nishimura, Shinichi; Akiyama, Yoshinori; and Hoshika, Yoshiaki, 4,411,470., Cl. 297-410.000.
Okada, Makoto, 4,411,598., Cl. 416-223.00R.
Sugasawa, Fukashi, 4,411,228., Cl. 123-198.00F.
Nitsche, Klaus: *See—*
Schutt, Peter; Bernhardt, Martin; Nitsche, Klaus; Grindler, Horst; and Hofmann, Hans-Joachim, 4,411,550., Cl. 403-358.000.
Nitto Chemical Industry Co., Ltd.: *See—*
Ito, Tomohisa; and Hongo, Akira, 4,411,799., Cl. 210-753.000.
Niyada, Katsuyuki; Watanabe, Taisuke; Hiraoka, Shoji; and Morii, Shuji, to Matsushita Electric Industrial Co., Ltd. Sound synthesizing apparatus. 4,412,099., Cl. 381-51.000.
NL Industries, Inc.: *See—*
Finlayson, Claude M.; and Mardis, Wilbur S., 4,412,018., Cl. 523-508.000.
Nayler, Douglas W. J.; and Smith, John D., 4,411,454., Cl. 285-26.000.
Pomerleau, Daniel G.; Slocombe, Douglas E.; and Watts, Kenneth H., 4,411,801., Cl. 252-8.50P.
Noack, W. L., to Becton, Dickinson and Company. Multiple tube rack. 4,411,868., Cl. 422-104.000.
Nogawa, Kenji: *See—*
Shibuya, Chuji; Kaneda, Satoshi; Kanehisa, Takashi; Kondo, Masatoshi; Nogawa, Kenji; and Hasuike, Fumio, 4,411,982., Cl. 430-314.000.
Nomura, Isshi: *See—*
Inada, Masami; and Nomura, Isshi, 4,411,406., Cl. 251-129.000.
Nomura, Junji: *See—*
Kato, Michio; Endo, Toshiyuki; and Nomura, Junji, 4,411,793., Cl. 210-656.000.
Nomura, Koji: *See—*
Hirakawa, Kan; Takakuma, Ryoji; Nomura, Koji; Katoh, Masami; and Watanabe, Kiyoshi, 4,411,991., Cl. 435-42.000.
Nomura, Yoshiyuki; and Okuda, Kanemasa, to Fujitsu Fanuc Limited. Wire-cut, electric discharge machine. 4,412,118., Cl. 219-69.00W.
Nonomura, Keisaku; Matsura, Masataka; and Wada, Tomio, to Sharp Kabushiki Kaisha. DAP, LCD Device with a bias voltage. 4,411,496., Cl. 350-347.00E.
Norris, Elwood G., to Taggart, Charles W. Piezoelectric crystal spark plug. 4,412,151., Cl. 315-55.000.
North American Manufacturing Company, The: *See—*
Homa, John L., 4,412,328., Cl. 371-25.000.
North American Philips Consumer Electronics Corp.: *See—*
Say, Donald L., 4,412,149., Cl. 313-414.000.
North Shore Precision Research Corporation: *See—*
Davidson, William W., Jr., 4,411,194., Cl. 101-216.000.
Northup, John D., to Northup, Ruth B.; Northup, John D., Jr.; Lehrkind, Nancy N.; and Northup, Mary E. Method and apparatus for manufacturing glass bottles. 4,411,681., Cl. 65-77.000.
Northup, John D., Jr.: *See—*
Northup, John D., 4,411,681., Cl. 65-77.000.
Northup, Mary E.: *See—*
Northup, John D., 4,411,681., Cl. 65-77.000.
Northup, Ruth B.: *See—*
Northup, John D., 4,411,681., Cl. 65-77.000.
Norton, William W., to Baxter Travenol Laboratories, Inc. Liquid delivery system. 4,411,047., Cl. 17-51.000.
Nossen, Edward J., to RCA Corporation. Digital phase demodulation and correlation. 4,412,302., Cl. 364-728.000.
Notman, Alan, to Imperial Chemical Industries PLC. Synthesis processes. 4,411,877., Cl. 423-359.000.
Novakovskaya, Zoya D.: *See—*
Denisov, Vladimir A.; Kulevskaya, Elena F.; Zhiltsov, Jury S.; Kuznetsova, Olga M.; Novakovskaya, Zoya D.; Kozlov, Vyacheslav I.; Korol, Vyacheslav K.; and Pershin, Nikolai I., 4,412,144., Cl. 310-49.00R.
November, Milton H., to International Telephone & Telegraph Corporation. Mass flowmeter or the like. 4,411,161., Cl. 73-861.030.
Nowak, Ralph: *See—*
Fogarty, Bonnie R.; Fogarty, A. Edward; Nowak, Ralph; and Lovewell, Jack S., 4,411,249., Cl. 124-64.000.
Nozaki, Mineo; Nagashima, Masasumi; and Asakura, Osamu, to Canon Kabushiki Kaisha. Printing apparatus. 4,411,540., Cl. 400-175.000.
NTN Toyo Bearing Co., Ltd.: *See—*
Kimata, Kei; Nakazeki, Tagito; and Yasuda, Yoshinobu, 4,411,244., Cl. 123-389.000.
Nuckols, Walter S.: *See—*
Bennett, Robert A.; and Nuckols, Walter S., 4,411,376., Cl. 222-212.000.
Nuclear Power Outfitters: *See—*
Jacobson, Earl B., 4,411,264., Cl. 128-201.230.
Nuesch, Jakob: *See—*
Schupp, Thomas; Traxler, Peter; and Nuesch, Jakob, 4,411,896., Cl. 424-244.000.
Nuovo Pignone S.p.A.: *See—*
Santucci, Nicola, 4,411,293., Cl. 139-110.000.
Nutrisearch Company: *See—*
Chang, Pei K., 4,411,917., Cl. 426-104.000.
Nutter, Steven D. Device for equally filling a plurality of containers. 4,411,295., Cl. 141-59.000.
Nuzillat, Gerard: *See—*
Peltier, Michel; Gloanec, Maurice; Nuzillat, Gerard; Maurel, Vincent; and Charrier, Michel, 4,412,336., Cl. 375-4.000.
O. M. Scott & Sons Company, The: *See—*
Goertz, Harvey M., 4,411,683., Cl. 71-28.000.
Obara, Hiroshi: *See—*
Nagura, Masato; Kikuchi, Kazushige; Obara, Hiroshi; and Endo, Yasushi, 4,412,147., Cl. 310-320.000.
Obayashi, Hidehito: *See—*
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Occidental Chemical Corporation: *See—*
Rosegren, Donald R.; and Mayer, Linda J., 4,411,744., Cl. 204-49.000.
Rosegren, Donald R.; and Mayer, Linda J., 4,411,965., Cl. 428-672.000.
Tremmel, Robert A., 4,411,961., Cl. 428-613.000.
O'Connor, Brendan F.; Phillips, John O.; and Webb, Charles M., to Udaras Na Gaeltachta. Apparatus for the inspection of translucent containers. 4,411,522., Cl. 356-240.000.
O'Dowd, Brendan; and Pitcher, Christopher. Tightly coupled multiple instruction multiple data computer system. 4,412,286., Cl. 364-200.000.
Offshore Company, The: *See—*
Radovan, Felix S.; Koehler, Albert M.; and Ray, Donald R., 4,411,408., Cl. 254-108.000.
Ofrex Group Limited: *See—*
Crane, Dennis P., 4,411,391., Cl. 241-232.000.
Ogawa, Hiroshi: *See—*
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Ogawa, Kazuo: *See—*
Fujii, Setsuro; Hamakawa, Toshihiro; Ogawa, Kazuo; Muranaka, Yoshiyuki; and Hashimoto, Sadao, 4,411,911., Cl. 424-283.000.
Ogawa, Masahiro: *See—*
Hara, Tomihiro; Ogawa, Masahiro; Tsukada, Masakazu; and Yamashita, Masaaki, 4,411,964., Cl. 428-626.000.
Ogawa, Seiki; Mito, Michio; and Shinoi, Tsuyoshi, to Nippon Telegraph & Telephone; and Nippon Tsushin Kogyo Kabushiki Kaisha. Key telephone system. 4,412,102., Cl. 179-99.00M.
Ogawa, Tadashi: *See—*
Kobayashi, Hidetoshi; Watanabe, Toshiyuki; Adachi, Keiichi; and Ogawa, Tadashi, 4,411,987., Cl. 430-542.000.
Ogawa, Tomoya, to Fuji Photo Optical Co., Ltd. Method of analyzing an object by use of scattering light. 4,411,525., Cl. 356-339.000.
Ogino, Fumiichi; and Nakashima, Koji, to Takeda Chemical Industries, Ltd. Air filter of three-dimensional mesh-structured webs. 4,411,948., Cl. 428-283.000.
Ogino, Makoto; Fujiu, Takamitsu; Kariya, Michio; and Ichimura, Takeo, to Nippon Kogaku K.K. Dental implant. 4,411,624., Cl. 433-173.000.
Oguino, Masanori, to Hatachi, Ltd. Automatic noise removal device for a picture signal. 4,412,253., Cl. 358-167.000.
Ohara, Osamu: *See—*
Fujii, Kiyonobu; Ikeda, Kotaro; Okuno, Kenji; Saito, Koichi; and Ohara, Osamu, 4,412,103., Cl. 179-115.50R.
Oharek, Frank J.: *See—*
Breglia, Denis R.; Oharek, Frank J.; and Grimmer, Paul D., 4,411,627., Cl. 434-44.000.
Ohashi, Naohito; Nagata, Shoji; and Katsube, Junki, to Sumitomo Chemical Company, Limited. Racemization of an α-methyl-β-acylthiopropionic acid. 4,411,836., Cl. 260-455.00R.

Ohio Blow Pipe Co.: *See*—
Forgac, John P., 4,411,674., Cl. 55-304.000.
Ohkubo, Yuichi: *See*—
Kominami, Yasuo; Sato, Tetsuo; and Ohkubo, Yuichi, 4,412,189., Cl. 333-14.000.
Ohmae, Tadayuki: *See*—
Hashizume, Shuhei; Abeta, Sadaharu; Ohmae, Tadayuki; and Nishibara, Hajime, 4,411,666., Cl. 8-455.000.
Ohmura, Eiichi; and Kitano, Tateo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Construction of a door beam of a motor vehicle. 4,411,103., Cl. 49-502.000.
Ohnemus, Kurt: *See*—
Hoegerle, Karl; and Ohnemus, Kurt, 4,412,074., Cl. 544-298.000.
Ohnishi, Tatsuo; Uemura, Takeshi; and Nakajima, Teruo, to Tsubakimoto Chain Co. Chain link plate. 4,411,131., Cl. 59-78.000.
Ohnuma, Takashi, to Canon Kabushiki Kaisha. Lens system driving device. 4,412,164., Cl. 318-596.000.
Ohsawa, Yuzo: *See*—
Itaba, Takeshi; Nishiyama, Akio; Kikuchi, Noribumi; Shingyoji, Takayuki; and Ohsawa, Yuzo, 4,411,763., Cl. 204-298.000.
Ohtawa, Kimiaki; and Fukada, Yasuo, to Mitsubishi Jukogyo kabushiki Kaisha. Briquetting machine. 4,411,611., Cl. 425-237.000.
Oka, Mitsunori: *See*—
Yoshii, Masaki; Sato, Hidemi; Kaneda, Aizo; Aoki, Masayoshi; Yokono, Hitoshi; and Oka, Mitsunori, 4,411,609., Cl. 425-149.000.
Oka, Shunzo: *See*—
Mitsugi, Itaru; Oka, Shunzo; Nakagawa, Yoshinobu; and Shiho, Kenichi, 4,412,113., Cl. 200-67.0DB.
Okada, Makoto, to Nissan Motor Company, Limited. Fluid propeller fan. 4,411,598., Cl. 416-223.00R.
Okada, Sunao: *See*—
Suzuki, Kensuke; and Okada, Sunao, 4,411,780., Cl. 210-150.000.
Okamura, Takayuki: *See*—
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Okayasu, Shinya: *See*—
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Oko, Uriel M.: *See*—
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Okuda, Kanemasa: *See*—
Nomura, Yoshiyuki; and Okuda, Kanemasa, 4,412,118., Cl. 219-69.00W.
Okumura, Takeshi; Nakanishi, Kiyoshi; and Inoue, Tokuta. Intake system for an internal combustion engine. 4,411,226., Cl. 123-188.00M.
Okuno, Kenji: *See*—
Fujii, Kiyonobu; Ikeda, Kotaro; Okuno, Kenji; Saito, Koichi; and Ohara, Osamu, 4,412,103., Cl. 179-115.50R.
Okuno, Michiharu, to Mitsubishi Denki Kabushiki Kaisha. Circuit interrupter. 4,412,115., Cl. 200-148.00A.
Okuno, Takao: *See*—
Tanahashi, Toshio; Sumitani, Sinya; Matuura, Takeo; Ichikawa, Shinji; and Okuno, Takao, 4,411,845., Cl. 261-65.000.
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Okuzawa, Yasutoshi: *See*—
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Yamaguchi, Nobutaka; Tsuji, Nobuo; Okuzawa, Yasutoshi; Nasu, Norio; and Fujiyama, Masaaki, 4,411,966., Cl. 428-695.000.
Oldweiler, Morey E., to Exxon Research & Engineering Co. Integrated two stage coking and steam cracking process and apparatus therefor. 4,411,769., Cl. 208-54.000.
Olivier, Paul D. Electrolytic chlorine generator. 4,411,759., Cl. 204-260.000.
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Ernst, Horst M., to SKF Kugellagerfabriken GmbH. Rolling bearing for lengthwise guiding of a shaft or the like. 4,411,478., Cl. 308-6.00C.
Olshansky, Semen A.: *See*—
Zitser, Vitaly A.; Bachelis, Leonid V.; Melnikov, Alexandr V.; Dreishev, Igor I.; Shishkin, Nikolai K.; Morozov, Jury E.; Ivanov, Vladimir A.; Olshansky, Semen A.; and Ryabinin, July V., 4,411,586., Cl. 414-728.000.
Olson, Wayne P., to Baxter Travenol Laboratories, Inc. Particle adsorption. 4,411,795., Cl. 210-679.000.
Olympus Optical Company Ltd.: *See*—
Imai, Toshihiro, 4,412,127., Cl. 250-204.000.
Shirai, Hitoshi, 4,411,509., Cl. 354-212.000.
Onesto, Joseph B.: *See*—
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Onishi, Hiroshi; Yamashita, Sadahiko; and Makimoto, Mitsuo, to Matsushita Electric Industrial Co., Ltd. Microwave mixing circuit. 4,412,351., Cl. 455-317.000.
Ono, Takatoshi: *See*—
Sekiya, Shinji; and Ono, Takatoshi, 4,411,107., Cl. 51-209.00R.
Opitz, Eric J. Walking aid tip assembly. 4,411,284., Cl. 135-81.000.
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Kuhlman, Bruce E.; and Kamerling, Marc A., 4,412,255., Cl. 358-245.000.
Optilon W. Erich Heilmann GmbH: *See*—
Heimberger, Halmut, 4,411,211., Cl. 112-265.200.
Orban Associates, Inc.: *See*—
Orban, Robert A., 4,412,100., Cl. 381-100.000.
Orban, Robert A., to Orban Associates, Inc. Multiband signal processor. 4,412,100., Cl. 381-100.000.
Oregon Graduate Center for Study and Research, The: *See*—
Massey, Gail A., 4,412,173., Cl. 324-62.000.
Orengo, Gerard: *See*—
Froment, Jean-Claude; Marijon, Jean-Louis; Orengo, Gerard; and Verhaeghe, Michel, 4,412,335., Cl. 375-3.000.
Ornstein, Leonard; and Kim, Young R., to Technicon Instruments Corporation. Method for treating red blood cells to effect sphering and reagent therefor. 4,412,004., Cl. 436-10.000.
Oscar Mayer & Co., Inc.: *See*—
Cornish, Darrel G.; and Hartl, Carroll P., 4,411,122., Cl. 53-436.000.
Oster, Winton: *See*—
Close, Albert R.; and Oster, Winton, 4,411,069., Cl. 30-276.000.
Ostrander, Clinton R. Reduction gas detector. 4,411,867., Cl. 422-91.000.
Oswell, Hugh H. B., to Submarine Products Limited. Demand valve. 4,411,285., Cl. 137-112.000.
Ota, Chuichi: *See*—
Imamura, Nobutake; and Ota, Chuichi, 4,412,264., Cl. 360-131.000.
Ota, Masataka, to Elmo Company, Limited. Power supply for an ac discharge lamp. 4,412,156., Cl. 315-308.000.
Otis Elevator Company: *See*—
Kettle, John L., 4,411,352., Cl. 198-328.000.
Otomo, Shigekazu: *See*—
Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; Kimura, Takeshi; Kumasaka, Noriyuki; and Fujiwara, Hideo, 4,411,716., Cl. 148-403.000.
Otsuka, Masasuke; Maniwa, Hideyo; and Nishina, Shinya. Low-carat corrosion-resistant gold alloy with the skin of the alloy not being blacked upon casting. 4,411,863., Cl. 420-580.000.
Ott, Roger A.: *See*—
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Otten, Jay G.: *See*—
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Poppe, Wassily; Craddock, Charles F.; Gutekunst, Robert W.; Ladd, Robert G.; and Mager, Sue A., to Standard Oil Company (Indiana). Shrinkage reduction of blow molded oriented pet bottle. 4,411,610., Cl. 425-174.400.
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Radek, John R., to Ready Metal Manufacturing Company. Door control. 4,411,102., Cl. 49-110.000.
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Ragonese, Louis J.; Schmitz, Nicholas A.; Bevacqua, Saverio F.; and Owyang, King, to General Electric Company. Integrated circuit incorporating low voltage and high voltage semiconductor devices. 4,412,142., Cl. 307-477.000.
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Raitto, Russell G., to Concord Laboratories, Inc. Syringe. 4,411,275., Cl. 128-763.000.
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Riley, Douglas E., to Diamond Automations, Inc. Egg transfer head. 4,411,574., Cl. 414-121.000.
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Abbott, Ned E.; Keshavan, Hampapar R.; and McGuire, Robert J., 4,412,323., Cl. 370-16.000.
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Rogers, James T. Seed planter. 4,411,205., Cl. 111-1.000.
Rohm, Gunter H. Collet-type chuck. 4,411,568., Cl. 409-233.000.
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Rosenquist, Niles R., to General Electric Company. Cycloalkyl carbonyl end-capped aromatic polycarbonates. 4,412,060., Cl. 528-196.000.
Rosi, David, to Sterling Drug Inc. Novel compounds of the gentamicin class. 4,412,068., Cl. 536-13.600.
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Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,412,069., Cl. 542-429.000.
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Runavot, Yves; Billault, Georges; and Salvetat, Jaques, to National Starch and Chemical Corporation. Hot melt adhesive compositions employing resins based on 2-methyl styrene, styrene and a phenol. 4,412,030., Cl. 524-505.000.
Runeric, Ronald A. Fishing fly with synthetic feather. 4,411,089., Cl. 43-42.530.
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Ruther, Hubert. Multi-purpose wheel particularly useful for games and demonstrations. 4,411,639., Cl. 474-902.000.

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Angersbach, Wolfgang; and Schuler, Peter, 4,412,163., Cl. 318-567.000.
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Schuster, Harald, to Licentia Patent-Verwaltungs-GmbH. Frequency conversion circuit. 4,412,352., Cl. 455-319.000.
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Kreissig, Ernst F., 4,411,202., Cl. 105-199.00R.
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Miller, Wendell E., 4,411,189., Cl. 91-420.000.
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Scovill Inc.: *See*—
Kuypers, Harold A., 4,411,302., Cl. 152-427.000.
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Bergman, Gunnar B., 4,411,212., Cl. 114-125.000.
Secter, Michael. Hand covering. 4,411,026., Cl. 2-158.000.
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Minvielle, Monique L. S.; Mazoin, Albert H. F.; Brun, Robert P.; Chevanne, Sylvain V. L.; and See, Jacques L. A., 4,411,555., Cl. 405-50.000.
Seibert, Karl; Praetorius, Heinz; and Poppel, Gunter, to Akzona Incorporated. Use of alkylene oxide copolymers as emollients in cosmetic preparations. 4,411,887., Cl. 424-78.000.
Seiy, Robert, to Kempsmith Machine Company, The. Hanger rod transfer assembly for hanging-typefile folders. 4,411,727., Cl. 156-562.000.
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Igashira, Toshihiko; Tanaka, Takeshi; Sekiguchi, Kiyonori; and Yanagihara, Hiromichi, 4,411,242., Cl. 123-569.000.
Sekikawa, Nobuyoshi; Iwakura, Ken; Miyamoto, Akio; and Satomura, Masato, to Fuji Photo Film Co., Ltd. Desensitizer compositions. 4,411,700., Cl. 106-23.000.
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Sekiya, Shinji; and Ono, Takatoshi, to Disco Co., Ltd. Grinding wheel for flat plates. 4,411,107., Cl. 51-209.00R.
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Gaske, Joseph E.; Plaisance, Thomas H.; and Sekmakas, Kazys, 4,412,032., Cl. 524-538.000.
Sell, Michael R., to Black & Decker, Inc. Battery charging and indicating circuit. 4,412,168., Cl. 320-48.000.
Senco Products, Inc.: *See*—
Warman, Thomas E., 4,411,378., Cl. 227-19.000.
Senta, Therese A.: *See*—
Johnson, Dee L.; Senta, Therese A.; and Sirvio, Larry M., 4,411,893., Cl. 424-181.000.
Servas, Francis M.: *See*—
Dickens, Duane D.; and Servas, Francis M., 4,411,783., Cl. 210-304.000.
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Yong, Raymond N.; and Sethi, Amar J., 4,412,007., Cl. 436-139.000.
Sevenants, Michael R., to Procter & Gamble Co., The. Cream flavor composition for use with buttery flavored food products. 4,411,924., Cl. 426-534.000.
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Miccoli, Franco; and Corda, Giuseppe, 4,412,311., Cl. 365-185.000.
Shachihata Industrial Co., Ltd.: *See*—
Fujihara, Naoyuki, 4,411,192., Cl. 101-111.000.
Shafer, Philip E.: *See*—
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Shanley, Robert L., II, to RCA Corporation. Switching circuit for television receiver on-screen display. 4,412,244., Cl. 358-22.000.

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Perry, Clifford R.; Dietz, Lloyd H.; and Shannon, Roger L., 4,411,310., Cl. 165-166.000.

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Awaji, Hidekazu, 4,412,135., Cl. 250-551.000.
Isaka, Kinichi; Kawaguchi, Masashi; and Uede, Hisashi, 4,412,155., Cl. 315-246.000.
Minezaki, Shigehiro, 4,411,981., Cl. 430-299.000.
Nonomura, Keisaku; Matsura, Masataka; and Wada, Tomio, 4,411,496., Cl. 350-347.00E.
Washizuka, Isamu; and Hashimoto, Shintaro, 4,412,210., Cl. 340-365.00S.

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Shearer, James T., Jr., to Rapistan Division, Lear Siegler, Inc. Vehicle sensor monitoring system. 4,411,577., Cl. 414-274.000.

Shearhart, Billy G., to Sooner Oil Tools, Inc. Attachment means for use for insertion and retrieval of a casing packer. 4,411,314., Cl. 166-124.000.

Sheehan, Ronald T.: *See*—
Rowland-Hill, E. William; and Sheehan, Ronald T., 4,411,124., Cl. 56-10.200.

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Harrison, John D., 4,411,389., Cl. 239-427.500.

Shell Oil Company: *See*—
Mulder, Nicolaas; Terlouw, Willem; and Wevers, Jan H., 4,412,089., Cl. 585-645.000.
van Gogh, Johan; and Grol, Hermanus, 4,412,056., Cl. 528-112.000.

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Neches, Philip M.; Hartke, David H.; Stockton, Richard C.; Watson, Martin C.; Cronshaw, David; and Shemer, Jack E., 4,412,285., Cl. 364-200.000.

Shepard, Charles E.: *See*—
Eckes, William A.; Rhoades, Russell H.; Vorreiter, John W.; Wiesner, John. C.; and Shepard, Charles E., 4,412,133., Cl. 250-492.200.

Shepherd, Robert G., to American Cyanamid Company. 4-[(Monosubstituted-alkyl)amino]benzoic acids and analogs as hypolipidemic and antiatherosclerotic agents. 4,411,903., Cl. 424-267.000.

Sheppard, Peter H. Installation and retainer device for power steering pitman arm. 4,411,549., Cl. 403-258.000.

Sherif, Fawzy G., to Stauffer Chemical Company. Process for the manufacture of highly pure trimagnesium phosphate octahydrate of high purity. 4,411,876., Cl. 423-311.000.

Sherman, Sidney L.: *See*—
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Shibakawa, Riichiro: *See*—
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Shibuya, Chuji; Kaneda, Satoshi; Kanehisa, Takashi; Kondo, Masatoshi; Nogawa, Kenji; and Hasuike, Fumio, to Matsushita Electric Industrial Co., Ltd. Method of making flexible printed circuits. 4,411,982., Cl. 430-314.000.

Shiga, Akinobu; Naito, Yukio; Sasaki, Toshio; Kojima, Junpei; and Yoshioka, Hiroshi, to Sumitomo Chemical Company, Limited. Process for producing highly stereoregular α-olefin polymers. 4,412,049., Cl. 526-127.000.

Shigesada, Shigeki; Kitagawa, Hironoshin; Mihara, Toshio; and Ishimatsu, Yoshiaki, to Denki Kagaku Kogyo Kabushiki Kaisha. Immobilization of enzymes on granular gelatin. 4,411,999., Cl. 435-177.000.

Shihabi, David S.: *See*—
Chen, Nai Y.; Scott, Eric J.; and Shihabi, David S., 4,411,770., Cl. 208-111.000.

Shiho, Kenichi: *See*—
Mitsugi, Itaru; Oka, Shunzo; Nakagawa, Yoshinobu; and Shiho, Kenichi, 4,412,113., Cl. 200-67.0DB.

Shiiki, Kazuo; Otomo, Shigekazu; Kudo, Mitsuhiro; Kimura, Takeshi; Kumasaka, Noriyuki; and Fujiwara, Hideo, to Hitachi, Ltd.; Hitachi Metals, Ltd.; and Research Development Corporation of Japan. Amorphous alloys for magnetic head core and video magnetic head using same. 4,411,716., Cl. 148-403.000.

Shiley Incorporated: *See*—
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Shimada, Shojiro, to Sony Corporation. Magnetic recording and playback apparatus. 4,412,258., Cl. 360-62.000.

Shimano Industrial Company Limited: *See*—
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Shimazaki, Keishi; Nakamura, Yoshihiro; and Yamada, Yasutsugu, to Ajinomoto Company Incorporated. Method for producing L-lysine by fermentation. 4,411,997., Cl. 435-115.000.

Shimizu, Motoharu: *See*—
Fujita, Osamu; Goshi, Noriaki; Okayasu, Shinya; Shimizu, Motoharu; and Kakinuma, Nobuo, 4,412,104., Cl. 179-117.000.

Shimizu, Noboru: *See*—
Kitada, Masahiro; Suenaga, Masahide; Tsukada, Yukihisa; Shimizu, Noboru; and Yamamoto, Hiroshi, 4,411,757., Cl. 204-192.00E.

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Miyamoto, Akira; Ishikawa, Masaru; Nishi, Masaaki; Ishizawa, Kenki; and Shiranita, Akira, 4,412,008., Cl. 501-97.000.

Shingyoji, Takayuki: *See*—
Itaba, Takeshi; Nishiyama, Akio; Kikuchi, Noribumi; Shingyoji, Takayuki; and Ohsawa, Yuzo, 4,411,763., Cl. 204-298.000.

Shinoda, Kazuo; Kobayashi, Nobuyuki; and Isobe, Toshiaki, to Toyota Jidosha Kogyo Kabushiki Kaisha. Fuel injection system for internal combustion engine. 4,411,235., Cl. 123-488.000.

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Sakai, Shinji; Shinoda, Nobuhiko; Hosoe, Kazuya; and Kinoshita, Takao, 4,411,505., Cl. 354-25.000.

Shinoi, Tsuyoshi: *See*—
Ogawa, Seiki; Mito, Michio; and Shinoi, Tsuyoshi, 4,412,102., Cl. 179-99.00M.

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Shioda, Toshiyuki, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Sand mold-producing apparatus. 4,411,303., Cl. 164-182.000.

Shirai, Hitoshi, to Olympus Optical Company Ltd. Take-up assembly for automatic film loading of camera. 4,411,509., Cl. 354-212.000.

Shiranita, Akira: *See*—
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Shirano, Kenji: *See*—
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Shirazawa, Takashi: *See*—
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Shishkin, Nikolai K.: *See*—
Zitser, Vitaly A.; Bachelis, Leonid V.; Melnikov, Alexandr V.; Dreishev, Igor I.; Shishkin, Nikolai K.; Morozov, Jury E.; Ivanov, Vladimir A.; Olshansky, Semen A.; and Ryabinin, July V., 4,411,586., Cl. 414-728.000.

Showa Oil Company, Ltd.: *See*—
Matsumoto, Takao; Fujimaki, Atsushi; and Nagata, Takeo, 4,411,998., Cl. 435-144.000.

Shrader, John E.; and Zimmerschied, Alan B., to Boeing Company, The. Impact fuze. 4,411,198., Cl. 102-216.000.

Shumaker, John F., to J. I. Case Company. Optimized earthworking tool operating linkage. 4,411,584., Cl. 414-694.000.

Shumway, Durland K.: *See*—
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Shurney, Glenn A.: *See*—
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Sides, Larry W.: *See*—
Martin, Julian R.; and Sides, Larry W., 4,411,279., Cl. 131-94.000.

Siegel, John H.; and Edwards, Gerald L., to CX Corporation. Daylight film splicer. 4,411,725., Cl. 156-353.000.

Siegel, Vernon. Platform scale. 4,411,326., Cl. 177-211.000.

Siemens Aktiengesellschaft: *See*—
Diepers, Heinrich, 4,412,316., Cl. 367-105.000.
Feuerbaum, Hans P.; and Tobolka, Gerald, 4,412,191., Cl. 333-193.000.
Heinzl, Joachim; and von Borstel, Klaus P., 4,412,256., Cl. 358-283.000.
Horbaschek, Heinz, 4,412,247., Cl. 358-111.000.
Horninger, Karlheinrich, 4,412,139., Cl. 307-270.000.
Kampf, Erich, 4,411,052., Cl. 29-25.350.
Kaufhold, Wolfgang, 4,412,171., Cl. 322-20.000.
Mauthe, Manfred; and Pfleiderer, Hans-Jorg, 4,412,344., Cl. 377-60.000.
Voss, Erich; and Grafenschnell, Horst, 4,412,145., Cl. 310-154.000.

Siemionko, Roger K., to Du Pont de Nemours, E. I., and Company. Aromatic polyesters and high strength filaments thereof. 4,412,058., Cl. 528-191.000.

Silfvast, William T.: *See*—
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Silva, Raimund H.; and Smith, Roger A., to Du Pont de Nemours, E. I., and Company. Cation exchange membrane with high equivalent weight component. 4,411,750., Cl. 204-98.000.

Silverman, Harold; and Hotchkiss, Alan B., to Pitney Bowes Inc. Articulate bridge assembly. 4,411,419., Cl. 271-263.000.

Simak, Petr: *See*—
Naarmann, Herbert; Penzien, Klaus; Schlag, Johannes; and Simak, Petr, 4,411,826., Cl. 252-518.000.

Simmonds Precision Products, Inc.: *See*—
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Simon, Donald J.: *See*—
Field, Thomas R.; and Simon, Donald J., 4,411,254., Cl. 126-300.000.

Simonetti, Richard A.: *See*—
Lautzenheiser, William J.; Simonetti, Richard A.; Henderson, Martin E.; Edson, James B.; and Beeson, Kenneth E., 4,412,211., Cl. 340-514.000.

Simpson, John B.; and Robert, Edward W., to Advanced Cardiovascular Systems, Inc. Vascular guiding catheter assembly and vascular dilating catheter assembly and a combination thereof and methods for making the same. 4,411,055., Cl. 29-447.000.

Sims, Rex: *See*—
Trumbetas, Jerome F.; Sims, Rex; and Fioriti, Joseph A., 4,411,926., Cl. 426-565.000.

Sin Sui Lai: *See*—
Huang, Jiunn-Cherng, 4,411,029., Cl. 4-324.000.

Sinclair, Paul L., to Schlumberger Technical Corporation. Digital induction logging tool including a floating point A/D. 4,412,207., Cl. 340-347.0AD.

Singer Company, The: *See—*
Gamertsfelder, George R.; and Ljung, Bo Hans G., 4,411,527., Cl. 356-350.000.
Killinger, Karl H., 4,411,210., Cl. 112-199.000.
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Singh, Baldev: *See—*
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Sirvio, Larry M.: *See—*
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SKF Compagnie d'Applications Mecaniques - ADR: *See—*
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SKF Kugellagerfabriken GmbH: *See—*
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Ernst, Horst M., 4,411,478., Cl. 308-6.00C.

Slavitt, Jerome A. Athletic shoe with attached ankle brace. 4,411,077., Cl. 36-89.000.

Slocombe, Douglas E.: *See—*
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Smids, Petrus T. J. L.: *See—*
de Man, Hendrikus C. J.; and Smids, Petrus T. J. L., 4,412,051., Cl. 526-293.000.

Smith, Frank H., Jr.; and Mookerjee, Pradip K., to American Cyanamid Company. Emulsifiable concentrates of 2-chloro-N-isopropyl-2',3'-dimethylacetanilide with improved resistance to crystallization and process for preparing the same. 4,411,694., Cl. 71-118.000.

Smith, Jackson A. Tube pulling and lubricating system. 4,411,409., Cl. 254-134.3FT.

Smith, John D.: *See—*
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Smith, Paul: *See—*
Maurer, Franciscus H. J.; Pijpers, Jacques P. L.; and Smith, Paul, 4,411,854., Cl. 264-205.000.

Smith, Richard G.: *See—*
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Smith, Robert D., to Scandpower, Inc. Power performance monitoring system for nuclear reactor fuel core. 4,411,858., Cl. 376-247.000.

Smith, Robert D.; and Regazzoni, Pierre, to Scandpower, Inc. Gamma sensor having combined thermal bridge and centering means. 4,411,859., Cl. 376-247.000.

Smith, Roger A.: *See—*
Silva, Raimund H.; and Smith, Roger A., 4,411,750., Cl. 204-98.000.

Smith, Ronald D.: *See—*
Springer, Edward A.; and Smith, Ronald D., 4,411,101., Cl. 47-2.000.

Smith, Ronald L.: *See—*
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Smith, Samuel C. Educational toy doll with weight tending to return head. 4,411,096., Cl. 46-155.000.

Smith, Terrence R., to RCA Corporation. Memory-type sync generator with reduced memory requirements. 4,412,250., Cl. 358-150.000.

Smith, Timothy J. C., to Amchem Products, Inc. Autodeposited coatings with increased surface slip. 4,411,950., Cl. 428-327.000.

Smith, William I.; and Moyer, Harold, to William I. Smith. Pick and place mechanism. 4,411,576., Cl. 414-226.000.

Smiths Industries, Inc.: *See—*
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Smollar, Marvin: *See—*
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Snider, Scott C.; and DeLeon, Alberto, to Celotex Corporation, The. Polymeric foams from transesterified by-product derived from manufacture of dimethyl terephthalate and laminates therefrom. 4,411,949., Cl. 428-304.400.

Societe Anonyme dite: CERAVER: *See—*
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Societe Anonyme dite: L'Oreal: *See—*
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Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
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Societe d'Exploitation des Machines Dubuit: *See—*
Combeau, Guy, 4,411,191., Cl. 101-38.00A.

Societe Generale des Eaux Minerales de Vittel: *See—*
Gautier, Raoul L. A., 4,411,123., Cl. 53-550.000.

Societe Industrielle de Brevets et d'Etudes S.I.B.E.: *See—*
Chenet, Jacques; and Pierlot, Michel, 4,411,233., Cl. 123-439.000.

Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, "S.N.E.C.M.A.": *See—*
Joubert, Raymond J. M.; and Soligny, Marcel R., 4,411,589., Cl. 415-9.000.

Societe Nationale Industrielle Aerospatiale: *See—*
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Solarex Corporation: *See—*
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Soligny, Marcel R.: *See—*
Joubert, Raymond J. M.; and Soligny, Marcel R., 4,411,589., Cl. 415-9.000.

Solloway, Daniel S. Aquatic exercise assembly. 4,411,422., Cl. 272-96.000.

Somfy: *See—*
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Sony Corporation: *See—*
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Shimada, Shojiro, 4,412,258., Cl. 360-62.000.
Tanaka, Yutaka; and Isobe, Toshinobu, 4,412,251., Cl. 358-160.000.
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Uzuka, Mitsuo, 4,412,159., Cl. 318-254.000.
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Sooner Oil Tools, Inc.: *See—*
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Sorton, Gerard: *See—*
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Spenceley, Gene D.; and Welbourn, Brian C., to British Steel Corporation. Metal refining processes. 4,411,697., Cl. 75-60.000.

Speranza, George P.: *See—*
McCoy, David R.; Cuscurida, Michael; and Speranza, George P., 4,411,775., Cl. 208-188.000.

Sperry Corporation: *See—*
Diederich, Anthony F., Jr.; Haldeman, Peter P.; and Campbell, Willis R., 4,411,127., Cl. 56-364.000.
Rowland-Hill, E. William; and Sheehan, Ronald T., 4,411,124., Cl. 56-10.200.

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Spighi, Massimo: *See—*
Cimino, Andrea; Plicchi, Gianni; Mangiarotti, Luigi; Rossi, Maurizio; Betti, Vittorio; Spighi, Massimo; and Zingaretti, Gabriele, 4,411,918., Cl. 426-124.000.

Spitaler, Engelbert, to TMC Corporation. Release binding. 4,411,446., Cl. 280-628.000.

Spivack, Bruce D.: *See—*
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Springer, Edward A.; and Smith, Ronald D. Apparatus and method for heating the root zone of plants. 4,411,101., Cl. 47-2.000.

Springer, Gilbert D., to Ferix Corporation. Magnetic toner transfer apparatus. 4,411,512., Cl. 355-3.0TR.

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Yarborough, John M., Jr., 4,412,329., Cl. 371-47.000.

Sridhar, Bettadapur N. Nuclear reactor control apparatus. 4,411,857., Cl. 376-233.000.

Stadler, Donald A.: *See—*
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Stafford, Scott L.: *See—*
Gilligan, William H.; and Stafford, Scott L., 4,411,837., Cl. 260-455.00B.
Gilligan, William H.; and Stafford, Scott L., 4,411,838., Cl. 260-463.000.

Stahlmann, Rudolf: *See—*
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Stamicarbon B.V.: *See—*
de Man, Hendrikus C. J.; and Smids, Petrus T. J. L., 4,412,051., Cl. 526-293.000.
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Ball, Lawrence E.; Pichler, Martin A.; and Gaylor, V. Frances, 4,411,745., Cl. 204-59.00R.
Chan, Keng S., 4,411,798., Cl. 210-727.000.
Winters, Warren J., 4,412,130., Cl. 250-260.000.
Wu, Mu-Yen M.; and Ball, Lawrence E., 4,412,061., Cl. 528-315.000.

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Stark, Marvin: *See—*
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Stark, Reimund: *See—*
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Starvaski, Raymond R.; and Leger, Alfred R., to Morgan Construction Company. Pouring reel. 4,411,394., Cl. 242-83.000.

Stauffer Chemical Company: *See—*
Green, Laddie L.; and Matsumoto, Kent E., 4,411,686., Cl. 71-88.000.

Sherif, Fawzy G., 4,411,876., Cl. 423-311.000.
Stauffer, Michael K.: *See—*
Alfke, Peter H.; and Stauffer, Michael K., 4,412,339., Cl. 375-95.000.
Stearns, Charles F.; and Tutherly, Herbert W., to United Technologies Corporation. Fuel circuits for fuel controls. 4,411,133., Cl. 60-39.281.
Stedman, Robert N., to Caterpillar Tractor Co. Vehicle with multi-directional movement capabilities. 4,411,329., Cl. 180-7.00R.
Stedman, Thomas R.; and Voyda, Ronald A., to Walgreen Co. Conveyor device usable as bulkhead. 4,411,349., Cl. 193-35.00R.
Steffen, Hans: *See—*
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Steinberg, Eckard, to Kraftwerk Union Aktiengesellschaft. Method for protecting the casing tubes of nuclear reactor fuel rods. 4,411,861., Cl. 376-417.000.
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Steinhagen, Thomas C., to Gates Rubber Company, The. Method for plating a threaded member with an in situ thread protector. 4,411,934., Cl. 427-242.000.
Stella, Antonio; and Canova, Giuseppe, to R.B.L. Riello Bruciatori Legnago S.p.A. Lock out means in ignition devices for liquid fuel burners. 4,412,269., Cl. 361-263.000.
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Koffel, William K.; Tuley, Eugene N.; Gay, Charles H., Jr.; Troeger, Raymond E.; and Sterman, Albert P., deceased, 4,411,597., Cl. 416-92.000.
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Stern, Donald J.; and Allsop, Jon I. Manually-operated spray applicator. 4,411,387., Cl. 239-345.000.
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Stolar, Mike, 4,411,031., Cl. 4-502.000.
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Strickland, Hubert E. Multi-function apparatus for lawn maintenance. 4,411,125., Cl. 56-16.900.
Stricklin, John D.; Denero, Anthony D.; Quatro, Robert A.; and Duff, James A., to Magnetic Peripherals Inc. Cartridge receiver mechanism. 4,412,260., Cl. 360-97.000.
Striebich, Helmut, to Dr. Ing. h.c.F. Porsche AG. Drive unit, especially for motor vehicles. 4,411,135., Cl. 60-616.000.
Stroble, Carl P.: *See—*
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Strokee Enterprises: *See—*
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Stroup, Steven L. Apparatus for cutting tubing into predetermined lengths. 4,411,179., Cl. 82-71.000.
Strubeck, W. Douglas, to GTE Products Corporation. Digital data correlator. 4,412,301., Cl. 364-728.000.
Struben, Francis L.; and Struben, Jean C. Beam-braced awning. 4,411,109., Cl. 52-11.000.
Struben, Jean C.: *See—*
Struben, Francis L.; and Struben, Jean C., 4,411,109., Cl. 52-11.000.
Strunk, Norman E.; and Pohoreski, Anton P. Stem securing means for conduits. 4,411,458., Cl. 285-196.000.
Stuart, Guy E., Jr. Door actuating mechanism. 4,411,465., Cl. 296-146.000.
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Sugasawa, Fukashi, to Nissan Motor Co., Ltd. Split type internal combustion engine. 4,411,228., Cl. 123-198.00F.
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Sugie, Osamu: *See—*
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Sugitani, Hiroshi, to Canon Kabushiki Kaisha. Method of forming an ink-jet head. 4,412,224., Cl. 346-1.100.
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Sugiura, Yoshihide: *See—*
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Suimon, Yoshio. Steering mechanism for running toy. 4,411,100., Cl. 46-235.000.
Sulasaari, Jukka; and Heinonen, Seppo, to Outokumpu Oy. Method and apparatus for the straightening and stiffening of starting sheets in electrolytic refining plants. 4,411,146., Cl. 72-180.000.
Sumida, Morihiro: *See—*
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Sumitomo Chemical Company, Limited: *See—*
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Sumitomo Durez Company, Ltd.: *See—*
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Sundstrand Corporation: *See—*
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LeClair, Francis J.; and Surgant, John M., 4,411,693., Cl. 71-118.000.
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Suzuki, Hitoshi: *See—*
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Suzuki, Kazuo: *See—*
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Suzuki, Migaku; and Sakai, Takashi, to Mitsubishi Rayon Co. Ltd.; and Mitsubishi Adetate Co. Ltd. Method for producing a tobacco smoke filter plug. 4,411,641., Cl. 493-46.000.
Sweco, Incorporated: *See—*
Jones, Bradley N.; Harris, Robert J.; Cram, Ronald P.; and Huber, Gene A., 4,411,673., Cl. 55-41.000.
Swift, Joe M.: *See—*
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Szostak, Jan; and Schaeflern, Henry, to Singer Company, The. Cam selector mechanism for sewing machines. 4,411,209., Cl. 112-158.00A.
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Tagami, Ichizo, to Ishikawajima-Harima Heavy Industries Co., Ltd. Method of and system for measuring temperature and spectral factor. 4,411,519., Cl. 356-45.000.
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Norris, Elwood G., 4,412,151., Cl. 315-55.000.
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Taguchi, Michihiro, to Yamaha Hatsudoki Kabushiki Kaisha. Rotary type pump resistant to muddy water. 4,411,593., Cl. 415-173.00R.
Taiho Pharmaceutical Company, Limited: *See*—
Fujii, Setsuro; Hamakawa, Toshihiro; Ogawa, Kazuo; Muranaka, Yoshiyuki; and Hashimoto, Sadao, 4,411,911., Cl. 424-283.000.
Tailleux, Christian; and Charbonneau, Jacques, to Multidick Inc. Printing press within tear-line tracing means. 4,411,195., Cl. 101-226.000.
Takada, Juichiro. Passive type vehicle occupant restraint belt system with electrical braking. 4,411,448., Cl. 280-802.000.
Takada, Juichiro. Connecting member for a drive wire casing in passive seat belt systems. 4,411,449., Cl. 280-804.000.
Takahashi, Hiroshi; and Saito, Yasuo, to Kioritz Corporation. Chain saw. 4,411,071., Cl. 30-381.000.
Takahashi, Hiroshi; and Abe, Katsuhiro, to Mitsubishi Petrochemical Company Limited. Ring-opened norbornyl polymers. 4,412,044., Cl. 525-329.500.
Takahashi, Kenichi; Hirano, Koichi; and Futamura, Shoji, to Bridgestone Tire Co., Ltd.; and Institute of Technology Precision Electrical Discharge Works. Method for making a ring-shaped mold. 4,411,175., Cl. 76-107.00R.
Takaishi, Naotake: *See*—
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Takaya, Takao; and Murata, Masayoshi, to Fujisawa Pharmaceutical Co., Ltd. 7-[2-Oxyimino-2-(2-aminothiazol-4-yl)acetamido]-3-(1-carboxyalkyl-1H-tetrazol-5-yl)thiomethyl-3-cephem-4-carboxylic acid compounds. 4,411,898., Cl. 424-246.000.
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Takenouti, Eisuke; and Urata, Sigeru, to Tokyo Shibaura Denki Kabushiki Kaisha. X-Ray photography apparatus. 4,412,346., Cl. 378-181.000.
Takeuchi, Shigeru, to Kurimoto Iron Works, Ltd. Glass fiber-reinforced cement plates. 4,411,723., Cl. 156-242.000.
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Tanabe Seiyaku Co., Ltd.: *See*—
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Tanahashi, Toshio; Sumitani, Sinya; Matuura, Takeo; Ichikawa, Shinji; and Okuno, Takao, to Nippondenso Co., Ltd.; and Toyota Jidosha Kogyo Kabushiki Kaisha. Throttle valve assembly. 4,411,845., Cl. 261-65.000.
Tanaka, Chuji: *See*—
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Tanaka, Hironari; Ishibashi, Tadashi; and Koyama, Masaharu, to Hitachi, Ltd. Liquid crystal display element having non-display electrode arrangement. 4,412,214., Cl. 340-765.000.
Tanaka, Kazunori: *See*—
Nishino, Takao; Yamaguchi, Toshihiro; and Tanaka, Kazunori, 4,412,213., Cl. 340-753.000.
Tanaka, Kazuyoshi: *See*—
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Blacklin, Peter A.; Dougherty, James R.; Johnson, Richard J.; and Tate, Donald L., 4,411,121., Cl. 52-792.000.
Tate, Donald L.: *See*—
Blacklin, Peter A.; Dougherty, James R.; Johnson, Richard J.; and Tate, Donald L., 4,411,121., Cl. 52-792.000.
Tateyama, Kenichi; Matsumiya, Yasuo; and Hishinuma, Toshio, to Hitachi, Ltd. Magnetic disk memory device. 4,412,261., Cl. 360-98.000.
Taub, Ronald H. Erectable display assembly with self-contained packaged product. 4,411,382., Cl. 229-16.00D.
Taylor, Bryon K.; and Riddle, George H. N., to RCA Corporation. Video disc player with self calibrating stylus translator. 4,412,319., Cl. 369-43.000.
Taylor, Stephen P., to Smiths Industries, Inc. Graphics clipping circuit. 4,412,296., Cl. 364-521.000.
TDK Electronics Co., Ltd.: *See*—
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Tokuda, Fukunori; and Nakashima, Yutaka, 4,411,957., Cl. 428-425.900.
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Carmen, Ralph H., 4,412,249., Cl. 358-112.000.
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Technicraft, Inc.: *See*—
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Teich, Wesley W.: *See*—
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Teichert, Rainer, to Double A Products Company. Solenoid for directional valves. 4,412,196., Cl. 335-250.000.
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Leblanc, Raymond F.; and Cummins, William T., 4,411,556., Cl. 405-213.000.
Telettra- Telefonia Elettronica e Radio S.p.A.: *See*—
Molo, Francesco, 4,412,325., Cl. 370-70.000.
Tella, Richard P.: *See*—
Kelley, Robert B.; Birk, John R.; Martins, Henrique; and Tella, Richard P., 4,412,293., Cl. 364-513.000.
Teltone Corporation: *See*—
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Temple, Davis L., Jr.; and Yevich, Joseph P., to Mead Johnson & Company. Benzisothiazole and benzisoxazole piperazine derivatives. 4,411,901., Cl. 424-250.000.
Templeman, John J.: *See*—
Timmins, Cyril; and Templeman, John J., 4,411,039., Cl. 15-104.06R.
Tenthoff, Aloys, to Westfalia Separator AG. Systems of self-purging centrifugal separators for the separation and clarification of liquids containing solids. 4,411,645., Cl. 494-3.000.
Teradata Corporation: *See*—
Neches, Philip M.; Hartke, David H.; Stockton, Richard C.; Watson, Martin C.; Cronshaw, David; and Shemer, Jack E., 4,412,285., Cl. 364-200.000.
Terauchi, Kiyoshi, to Sanden Corporation. Scroll-type fluid displacement apparatus with cup shaped casing. 4,411,604., Cl. 418-55.000.
Terbrack, William H.; and Hummel, Terry L., to Hughes Aircraft Company. Push-button operated electrical power source for an optical communication link. 4,412,355., Cl. 455-603.000.
Terlouw, Willem: *See*—
Mulder, Nicolaas; Terlouw, Willem; and Wevers, Jan H., 4,412,089., Cl. 585-645.000.

Ternant, Francois: *See—*
Jourdan, Francis; Marquet, Patrice; and Ternant, Francois, 4,411,521., Cl. 356-225.000.
Terrien, Michel E.; and Bouvet, Claude, to Etat Francais. Automatic device for lap joint connection on the intrados or extrados of two bridge elements and method for the carrying out thereof. 4,411,037., Cl. 14-2.600.
Terumo Corporation: *See—*
Kanno, Michio, 4,411,866., Cl. 422-25.000.
Tessier, Jean: *See—*
Martel, Jacques; Tessier, Jean; and Demoute, Jean-Pierre, 4,412,069., Cl. 542-429.000.
Testut Aequitas: *See—*
Valadier, Jean-Claude, 4,411,162., Cl. 73-862.650.
Tetra Pak Developpement SA: *See—*
Rausing, Hans, 4,411,370., Cl. 220-269.000.
Texaco Development Corporation: *See—*
Marion, Charles P.; and Jahnke, Frederick C., 4,411,670., Cl. 48-197.00R.
Marion, Charles P.; and Jahnke, Frederick C., 4,411,671., Cl. 48-197.00R.
Texaco Inc.: *See—*
Auld, David L.; and Miller, Herbert W., 4,411,782., Cl. 210-230.000.
Elliott, James F.; Richter, George N.; and Estabrook, Lawrence E., 4,411,817., Cl. 212-373.000.
Flournoy, Norman E., 4,412,315., Cl. 367-99.000.
Loftus, Jordan; and Woldy, Paul N., 4,411,533., Cl. 374-125.000.
McCoy, David R.; Cuscurida, Michael; and Speranza, George P., 4,411,775., Cl. 208-188.000.
Texas Instruments Incorporated: *See—*
Laughon, Thomas C.; and Philpott, Michael I., 4,411,628., Cl. 434-169.000.
Watts, LaVaughn F.; Smith, Ronald L.; Pandya, Yogendra C.; and Wood, Paul B., 4,412,294., Cl. 364-518.000.
Texasgulf Inc.: *See—*
Higgins, Rudolph S., 4,411,474., Cl. 299-4.000.
Thatcher, John: *See—*
Morrow, Lawrence R.; and Thatcher, John, 4,411,985., Cl. 430-352.000.
Theiler, Richard F., to Armour and Company. Process for preparing cooked meat having reduced levels of N-nitrosamines. 4,411,922., Cl. 426-266.000.
Theodorides, Panos. Hand saw. 4,411,068., Cl. 30-166.00R.
Thermosystem S.p.A.: *See—*
Maillard, Laurent; and Bregolin, Graziano, 4,411,116., Cl. 52-489.000.
Thibault, Bernard; and Le Goff, Andre, to Regie Nationale des Usines Renault. Transport installation for manufactured products, particularly elements of automobile bodies. 4,411,354., Cl. 198-472.000.
Thomas & Betts Corporation: *See—*
Grundfest, Michael A., 4,411,063., Cl. 29-751.000.
Thomas, Jacob E.; and McKnight, James K., to NCR Corporation. Ink evaporation prevention means for ink jet print head. 4,412,233., Cl. 346-140.00R.
Thomas, John D.: *See—*
Wallace, Harry L.; and Thomas, John D., 4,411,706., Cl. 134-37.000.
Thompson, David M.: *See—*
Kukucka, William P.; Hynes, Frank R.; Jones, Hugh L.; and Thompson, David M., 4,411,515., Cl. 355-14.0SH.
Thompson, Henry B., to W. R. Grace & Co., Cryovac Division. Meat adhearing cook-in packaging. 4,411,919., Cl. 426-412.000.
Thomson-CSF: *See—*
Duda, Eugene; Tondu, Claude; and Maumy, Alain, 4,411,057., Cl. 29-569.00L.
Jourdan, Francis; Marquet, Patrice; and Ternant, Francois, 4,411,521., Cl. 356-225.000.
Marguinaud, Andre; and Sorton, Gerard, 4,412,181., Cl. 329-50.000.
Peltier, Michel; Gloanec, Maurice; Nuzillat, Gerard; Maurel, Vincent; and Charrier, Michel, 4,412,336., Cl. 375-4.000.
Thornton, Jack C.; and Russell, Randy G., to Rockwell International Corporation. Variable inductor with carriage for multiple trolley wheels. 4,412,200., Cl. 336-139.000.
Thuillier, Denis; and Willem, Michel, to Societe Anonyme dite: CERAVER. Electric insulator of the line post type. 4,412,095., Cl. 174-158.00R.
Thyssen Industrie Ag Maschinenbau: *See—*
Bohm, Gunter; and Funk, Wolfram, 4,412,122., Cl. 219-137.00R.
Tidwell, Gerald W.: *See—*
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Jernstrom, Olof; Mattila, Tapio; Penttinen, Kyosti; and Toivonen, Hannu, 4,412,023., Cl. 524-106.000.
Timex Medical Products Corporation: *See—*
Schwarzschild, Jack, 4,411,535., Cl. 374-165.000.
Timmins, Cyril; and Templeman, John J., to British Gas Corporation. Removal of condensed gas from the walls of gas pipelines. 4,411,039., Cl. 15-104.06R.
Tinklenberg, Lloyd, to Bedford Industries, Inc. Method and apparatus for forming reclosable packages. 4,411,644., Cl. 493-213.000.
Tironi, Maurizio G.; Barbini, Mario; and Del Sere, Giannetto, to Elettromeccanica Tironi S.r.l. Method of melting vitreous materials and use of the suitable device for the accomplishment of the method. 4,412,334., Cl. 373-40.000.
Tirtiaux, Robert; and Lenack, Alain L. P., to Exxon Research & Engineering Co. Antifoam additives. 4,411,806., Cl. 252-49.600.
Tjepkes, Kendall D.: *See—*
Haight, Robert E.; and Tjepkes, Kendall D., 4,411,345., Cl. 192-12.00C.
TMC Corporation: *See—*
Spitaler, Engelbert, 4,411,446., Cl. 280-628.000.
Tobolka, Gerald: *See—*
Feuerbaum, Hans P.; and Tobolka, Gerald, 4,412,191., Cl. 333-193.000.
Toda, Hideo: *See—*
Kihara, Kunio; Toda, Hideo; Mori, Motokuni; and Sato, Koji, 4,412,011., Cl. 521-38.000.
Toia, Emilio, to Gruppo Lepetit, S.p.A. Antiinflammatory 3H-naphtho(1,2-d)imidazoles. 4,411,907., Cl. 424-273.00B.
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Jernstrom, Olof; Mattila, Tapio; Penttinen, Kyosti; and Toivonen, Hannu, 4,412,023., Cl. 524-106.000.
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Buuck, Frederick A., 4,412,265., Cl. 361-18.000.
Tokico Ltd.: *See—*
Katsumori, Teiji; Kato, Tetuo; and Ieaki, Miura, 4,411,342., Cl. 188-315.000.
Koshimizu, Naganori, 4,411,476., Cl. 303-6.00C.
Tokuda, Fukunori; and Nakashima, Yutaka, to TDK Electronics Co., Ltd. Magnetic recording medium. 4,411,957., Cl. 428-425.900.
Tokumitsu, Shunji; Urushibata, Hiroyuki; and Goto, Masao, to Sony Corporation. Record changer. 4,412,321., Cl. 369-233.000.
Tokyo Institute of Technology, The President of: *See—*
Yamaguchi, Shoichiro; and Kabayashi, Fujio, 4,412,289., Cl. 364-414.000.
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Iwasaki, Hiroshi; and Ozawa, Osamu, 4,412,239., Cl. 357-44.000.
Komatsu, Michiyasu; Tsuge, Akihiko; Komeya, Katsutoshi; and Ando, Akio, 4,412,009., Cl. 501-97.000.
Nagano, Katsumi, 4,412,186., Cl. 330-288.000.
Takenouti, Eisuke; and Urata, Sigeru, 4,412,346., Cl. 378-181.000.
Tomsu, David L., to Keeler Brass Company. Pivot support bracket for mirror assembly. 4,411,403., Cl. 248-575.000.
Tondu, Claude: *See—*
Duda, Eugene; Tondu, Claude; and Maumy, Alain, 4,411,057., Cl. 29-569.00L.
Tone, Junsuke: *See—*
Celmer, Walter D.; Cullen, Walter P.; Shibakawa, Riichiro; and Tone, Junsuke, 4,411,892., Cl. 424-181.000.
Toppan Printing Co., Ltd.: *See—*
Horikawa, Hisao; and Kano, Mitsuru, 4,411,365., Cl. 206-607.000.
Toray Silicone Company Ltd.: *See—*
Makino, Yoshio; Murata, Yoshihiko; Kakinuma, Toshiaki; Yamaguchi, Masaharu; and Fujisawa, Naoyuki, 4,411,702., Cl. 106-111.000.
Torri, Giangiacomo: *See—*
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Toshiba Silicones Ltd.: *See—*
Kurita, Akitsugu, 4,412,035., Cl. 524-796.000.
Toth, Istvan J.: *See—*
Derkacs, Thomas; Fetheroff, Charles W.; Matay, Istvan M.; and Toth, Istvan J., 4,411,940., Cl. 428-73.000.
Toth, Tibor; and Gils, Reiner, to Behringwerke A.G. Process for the determination of anti-hyaluronidase and an agent suitable for this purpose. 4,411,988., Cl. 435-7.000.
Totsuka, Kaoru: *See—*
Ishigaki, Yukinobu; Totsuka, Kaoru; Yamamoto, Makoto; and Miyaji, Naotaka, 4,412,097., Cl. 381-92.000.
Toudou, Sumio: *See—*
Sasaki, Yoshikazu; Inoue, Hiroshi; Miura, Tadashi; Kumamoto, Kazuo; and Toudou, Sumio, 4,411,952., Cl. 428-332.000.
Touze, Francois. Heat exchange devices for cooling the wall and refractory of a blast-furnace. 4,411,311., Cl. 165-170.000.
Townsend, Tod N. Bale handling apparatus. 4,411,573., Cl. 414-24.600.
Toyo Kogyo Co., Ltd.: *See—*
Nakanishi, Teruo, 4,411,709., Cl. 148-3.000.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
Fukui, Osamu; Umemoto, Yoshiro; Sanmiya, Tsugumi; Sano, Yutaka; and Tanaka, Kazuyoshi, 4,412,016., Cl. 523-206.000.
Igashira, Toshihiko; Tanaka, Takeshi; Sekiguchi, Kiyonori; and Yanagihara, Hiromichi, 4,411,242., Cl. 123-569.000.
Ohmura, Eiichi; and Kitano, Tateo, 4,411,103., Cl. 49-502.000.
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Tanahashi, Toshio; Sumitani, Sinya; Matuura, Takeo; Ichikawa, Shinji; and Okuno, Takao, 4,411,845., Cl. 261-65.000.
Yokoi, Takeshi; and Yanagihara, Noritaka, 4,411,174., Cl. 74-866.000.
Trane Company, The: *See—*
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Trans-World Manufacturing Corp.: *See—*
Kraus, John W., 4,411,084., Cl. 40-450.000.
TransFRESH Corporation: *See—*
Woodruff, Richard E., 4,411,921., Cl. 426-263.000.
Trautmann, Manfred: *See—*
Ulrich, Michael; Trautmann, Manfred; Heck, Gunter; and Malow, Egon, 4,411,846., Cl. 261-98.000.

Travenol European Research and Development Centre: *See*—
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Traver, Darwin G.; Anderson, Carl M.; and Abdelhamid, Amr N., to Carrier Corporation. Pressure variation absorber. 4,411,592., Cl. 415-119.000.

Traxler, Peter: *See*—
Schupp, Thomas; Traxler, Peter; and Nuesch, Jakob, 4,411,896., Cl. 424-244.000.

Tremmel, Robert A., to Occidental Chemical Corporation. Composite electroplated article and process. 4,411,961., Cl. 428-613.000.

Trepka, William J., to Phillips Petroleum Company. Viscosity index improver with high thickening power. 4,412,087., Cl. 585-12.000.

Trimedyne, Inc.: *See*—
Babb, Albert L., 4,411,792., Cl. 210-651.000.

Triumph-Adler A. G. fur Buro-und Informationstechnik: *See*—
Wenderoth, Karl; and Kuhn, Lothar, 4,411,542., Cl. 400-697.100.

Triumph-Adler A.G. fur Buro-und Informationstechnik: *See*—
Mansfeld, Manfred; and Wenderoth, Karl, 4,411,541., Cl. 400-213.000.

Trocino, Joseph L. Liquid explosive compositions for field operations. 4,411,718., Cl. 149-74.000.

Troeger, Raymond E.: *See*—
Koffel, William K.; Tuley, Eugene N.; Gay, Charles H., Jr.; Troeger, Raymond E.; and Sterman, Albert P., deceased, 4,411,597., Cl. 416-92.000.

Trotta, Robert A., to Gillette Company, The. Shaving cartridge assembly. 4,411,065., Cl. 30-47.000.

Trubell, Lawrence P.: *See*—
Cambier, Graig S.; and Trubell, Lawrence P., 4,412,278., Cl. 363-126.000.

Trumbetas, Jerome F.; Sims, Rex; and Fioriti, Joseph A., to General Foods Corporation. Stabilizer for frozen foamed emulsions and method therefore. 4,411,926., Cl. 426-565.000.

TRW Inc.: *See*—
Derkacs, Thomas; Fetheroff, Charles W.; Matay, Istvan M.; and Toth, Istvan J., 4,411,940., Cl. 428-73.000.
Larkin, Joseph F.; and Hodge, Malcolm H., 4,411,491., Cl. 350-96.210.
Miller, Laurence L., 4,411,606., Cl. 418-61.00B.
Winhan, Lucien C., 4,411,708., Cl. 148-1.500.

Tschan, J. Donald, to P. H. Bowman Co., Inc. Joist hanger. 4,411,548., Cl. 403-232.100.

Tseng, Chi-Ping, to Du Pont de Nemours, E. I., and Company. Fused [1,2,4]oxadiazolylidenebenzenesulfonamides and their use as herbicides and plant growth regulants. 4,411,690., Cl. 71-92.000.

Tsubakimoto Chain Co.: *See*—
Ohnishi, Tatsuo; Uemura, Takeshi; and Nakajima, Teruo, 4,411,131., Cl. 59-78.000.

Tsuge, Akihiko: *See*—
Komatsu, Michiyasu; Tsuge, Akihiko; Komeya, Katsutoshi; and Ando, Akio, 4,412,009., Cl. 501-97.000.

Tsuji, Nobuo: *See*—
Miyoshi, Takahito; Tsuji, Nobuo; Okutu, Toshimitu; and Fujiyama, Masaaki, 4,411,953., Cl. 428-336.000.
Yamaguchi, Nobutaka; Tsuji, Nobuo; Okuzawa, Yasutoshi; Natu, Norio; and Fujiyama, Masaaki, 4,411,966., Cl. 428-695.000.

Tsujio, Hisami: *See*—
Sakabe, Toshiaki; Matsumoto, Yasuhiro; and Tsujio, Hisami, 4,411,851., Cl. 264-137.000.

Tsukada, Masakazu: *See*—
Hara, Tomihiro; Ogawa, Masahiro; Tsukada, Masakazu; and Yamashita, Masaaki, 4,411,964., Cl. 428-626.000.

Tsukada, Yukihisa: *See*—
Kitada, Masahiro; Suenaga, Masahide; Tsukada, Yukihisa; Shimizu, Noboru; and Yamamoto, Hiroshi, 4,411,757., Cl. 204-192.00E.

Tsuno, Katsushige, to JEOL Ltd. Electron lens equipped with three magnetic pole pieces. 4,412,132., Cl. 250-396.0ML.

Tsuno, Kazuhiko: *See*—
Ninomiya, Youichi; and Tsuno, Kazuhiko, 4,411,407., Cl. 251-315.000.

Tsutsui, Ken: *See*—
Sasano, Akira; Nakano, Toshio; Tsutsui, Ken; Hashimoto, Michiaki; Kaneko, Tadao; Koike, Norio; and Izumi, Akiya, 4,412,236., Cl. 357-31.000.

Tuftec, Inc.: *See*—
Brock, James D.; and Morrison, Gerald B., 4,411,207., Cl. 112-79.00A.

Tuley, Eugene N.: *See*—
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Tumsuden, Herbert W., Jr.: *See*—
Bienwald, Wolfgang F.; and Tumsuden, Herbert W., Jr., 4,412,193., Cl. 335-18.000.

Turbo Resources Ltd.: *See*—
Johnson, Conrad B., 4,411,774., Cl. 208-179.000.

Turner, Norman L.: *See*—
Kalbfus, Charles R.; and Turner, Norman L., 4,412,153., Cl. 315-111.810.

Tusco Manufacturing Co.: *See*—
Everett, Lynn E., 4,411,400., Cl. 248-216.100.

Tutherly, Herbert W.: *See*—
Stearns, Charles F.; and Tutherly, Herbert W., 4,411,133., Cl. 60-39.281.

Twyman, Noel H., to Apros Corporation. Metallic scrap decontamination process. 4,411,695., Cl. 75-44.00S.

Tzodikov, Nathan R., to New England Nuclear Corporation. Composition and method for stabilizing radiolabeled compounds using thiocarbonylated diethylenetriamines. 4,411,881., Cl. 424-1.100.

UBE Industries, Ltd.: *See*—
Fukui, Osamu; Umemoto, Yoshiro; Sanmiya, Tsugumi; Sano, Yutaka; and Tanaka, Kazuyoshi, 4,412,016., Cl. 523-206.000.
Nagasawa, Toshio; and Nishihara, Yoshio, 4,412,125., Cl. 219-549.000.
Sasaki, Yoshikazu; Inoue, Hiroshi; Miura, Tadashi; Kumamoto, Kazuo; and Toudou, Sumio, 4,411,952., Cl. 428-332.000.

Udaras Na Gaeltachta: *See*—
O'Connor, Brendan F.; Phillips, John O.; and Webb, Charles M., 4,411,522., Cl. 356-240.000.

Ueda, Ikuo; Morino, Daizou; and Takimoto, Koichi, to Fujisawa Pharmaceutical Co., Ltd. Benzhydrylpiperozinyl thiazole derivatives and pharmaceutical composition comprising the same. 4,411,900., Cl. 424-250.000.

Uede, Hisashi: *See*—
Isaka, Kinichi; Kawaguchi, Masashi; and Uede, Hisashi, 4,412,155., Cl. 315-246.000.

Uehara, Teruhisa: *See*—
Kawate, Yoshio; Nagai, Nobuyuki; Horiuchi, Takefumi; Uehara, Teruhisa; and Hachiya, Susumu, 4,412,090., Cl. 136-230.000.

Ueki, Kazuyoshi: *See*—
Komatsu, Hideo; Iida, Shinya; Mizutani, Tatsumi; and Ueki, Kazuyoshi, 4,412,119., Cl. 219-121.0PF.

Uemura, Takeshi: *See*—
Ohnishi, Tatsuo; Uemura, Takeshi; and Nakajima, Teruo, 4,411,131., Cl. 59-78.000.

UFI Engineering & Manufacturing Co., Inc.: *See*—
Miksitz, Frank J., 4,411,377., Cl. 222-342.000.

Ullrich, Manfred: *See*—
Reutler, Herbert; Muller-Frank, Ulrich; Ullrich, Manfred; and Schepers, Hubert, 4,411,860., Cl. 376-338.000.

Ulrich, Michael; Trautmann, Manfred; Heck, Gunter; and Malow, Egon, to Hoechst Aktiengeseflschaft. Apparatus for absorbing gases. 4,411,846., Cl. 261-98.000.

Umemoto, Yoshiro: *See*—
Fukui, Osamu; Umemoto, Yoshiro; Sanmiya, Tsugumi; Sano, Yutaka; and Tanaka, Kazuyoshi, 4,412,016., Cl. 523-206.000.

Unger, Harold; Sze, Morgan C.; and Van Driesen, Roger P., to Lummus Company, The. Hydrogenation of high boiling hydrocarbons. 4,411,768., Cl. 208-59.000.

Union Carbide Corporation: *See*—
Corwin, Michael A.; and Foster, George N., 4,412,025., Cl. 524-241.000.
Leithauser, Douglas R.; and Young, John K., 4,411,138., Cl. 62-50.000.

United Foam Corporation: *See*—
Morgan, Charles W., 4,411,033., Cl. 5-450.000.

United Kingdom Atomic Energy Authority: *See*—
Conlon, Thomas W.; and Edeleanu, Constantin, 4,412,174., Cl. 324-65.0CR.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Fitzgerald-Smith, James P., 4,411,036., Cl. 14-2.400.

United States Gypsum Company: *See*—
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United States of America
Agriculture: *See*—
Boyles, David A.; Gaines, Jack R.; and Haissig, Bruce E., 4,411,684., Cl. 71-77.000.
Air Force: *See*—
Anderson, William S., 4,411,717., Cl. 149-18.000.
Brisken, Thomas A.; and Maier, Alexander G., 4,411,715., Cl. 148-131.000.
Army: *See*—
Bartlett, Marion C.; and Johnson, Raymond C., 4,412,340., Cl. 375-96.000.
Durenec, Peter; and Dunn, Aubrey J., 4,411,164., Cl. 74-55.000.
Durenec, Peter, 4,411,436., Cl. 277-53.000.
Miller, Thomas G.; and Polk, Robert G., 4,411,487., Cl. 350-1.100.
Pizzola, Robert M., 4,411,569., Cl. 409-261.000.
Vig, John R., 4,412,172., Cl. 324-56.000.
Workman, S. Thomas; Chambers, John L.; Pugh, Myron A.; and Ward, Roger W., 4,412,345., Cl. 378-078.000.
Health and Human Services: *See*—
Allcock, Harry R.; and Austin, Paul E., 4,412,066., Cl. 528-168.000.
National Aeronautics and Space Administration: *See*—
Dawn, Frederic S.; and Correale, James V., 4,411,660., Cl. 604-396.000.
Koffel, William K.; Tuley, Eugene N.; Gay, Charles H., Jr.; Troeger, Raymond E.; and Sterman, Albert P., deceased, 4,411,597., Cl. 416-92.000.
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Breglia, Denis R.; Oharek, Frank J.; and Grimmer, Paul D., 4,411,627., Cl. 434-44.000.
DeMarco, Michael, 4,411,172., Cl. 74-690.000.
Dunlap, Richard M., 4,411,384., Cl. 237-2.00B.

Gilligan, William H.; and Stafford, Scott L., 4,411,837., Cl. 260-455.00B.
Gilligan, William H.; and Stafford, Scott L., 4,411,838., Cl. 260-463.000.
Klicker, Kenneth A.; Newnham, Robert E.; Cross, Leslie E.; and Biggers, James V., 4,412,148., Cl. 310-358.000.
Paolino, Donald D., 4,412,192., Cl. 333-257.000.
Yates, Patrick A.; and McInnis, Patrick M., 4,411,199., Cl. 102-481.000.

U.S. Philips Corporation: *See—*
Kerforne, Jean-Francois; Le Gars, Jacques; and Remery, Michel, 4,412,284., Cl. 364-200.000.
McDonald, Richard L. C., 4,412,128., Cl. 250-213.0VT.
Wotherspoon, John T. M., 4,411,732., Cl. 156-643.000.

United States Steel Corporation: *See—*
Lewis, Leon L.; and Murray, Michael V., 4,411,145., Cl. 72-42.000.

United Technologies Corporation: *See—*
Bluege, John H., 4,411,492., Cl. 350-173.000.
Fishter, Robert E.; and Lada, Henry, 4,411,730., Cl. 156-626.000.
Murphy, Richard D.; and Clelford, Douglas H., 4,412,280., Cl. 364-200.000.
Reiser, Carl A.; and Maricle, Donald L., 4,411,968., Cl. 429-41.000.
Stearns, Charles F.; and Tutherly, Herbert W., 4,411,133., Cl. 60-39.281.

University of California, The Regents of the: *See—*
Kramer, Steven G.; and Yavitz, Edward Q., 4,411,652., Cl. 604-153.000.

University of Illinois, Board of Trustees of The: *See—*
Baldwin, Thomas O.; and Holzman, Thomas F., 4,412,001., Cl. 435-189.000.

University of Iowa Research Foundation: *See—*
Cox, Robert D.; and Frank, Clyde W., 4,412,006., Cl. 436-110.000.

University of Medicine and Dentistry of New Jersey: *See—*
Alexander, Harold; Parsons, John R.; Strauchler, Irving D.; and Weiss, Andrew B., 4,411,027., Cl. 3-1.000.

University of Rochester, The: *See—*
Klipstein, Frederick A.; Engert, Richard E.; and Clements, John D., 4,411,888., Cl. 424-92.000.

University of Southern California, The: *See—*
Yen, Teh F.; and Farmanian, Paul A., 4,411,816., Cl. 252-356.000.

University of Utah: *See—*
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University Patents, Inc.: *See—*
Salmon, Sydney E.; and Hamburger, Anne W., 4,411,990., Cl. 435-32.000.

UOP Inc.: *See—*
Carlson, David H. J., 4,411,776., Cl. 208-206.000.
Kroushl, Joseph A.; and Greenwood, Arthur R., 4,411,869., Cl. 422-188.000.
Kroushl, Joseph A.; and Greenwood, Arthur R., 4,411,870., Cl. 422-188.000.
Lester, George W.; and Malloy, Thomas P., 4,411,802., Cl. 252-8.55D.
Riley, Robert L., 4,411,787., Cl. 210-321.500.
Roberts, John T., 4,411,805., Cl. 252-47.000.

Upjohn Company, The: *See—*
Gammill, Ronald B., 4,412,071., Cl. 544-58.600.
Walker, Jerry A.; and Hessler, Edward J., 4,411,835., Cl. 260-397.450.

Uram, John R., Jr., to Goodyear Aerospace Corporation. Transparencies produced from epoxy resins cured with adducts of trimethoxyboroxine and benzyl alcohol and interlayers of mercaptan resins. 4,412,046., Cl. 525-506.000.

Uram, John R., Jr., to Goodyear Aerospace Corporation. Moisture permeation resistant resins from epoxy resins, polymercaptans, and aminosilanes. 4,412,052., Cl. 528-27.000.

Urata, Sigeru: *See—*
Takenouti, Eisuke; and Urata, Sigeru, 4,412,346., Cl. 378-181.000.

Urologic & Enteric Research Associates: *See—*
Cornett, Walter G., III, 4,411,656., Cl. 604-212.000.

Urushibata, Hiroyuki: *See—*
Tokumitsu, Shunji; Urushibata, Hiroyuki; and Goto, Masao, 4,412,321., Cl. 369-233.000.

USM Corporation: *See—*
Marzouki, Taieb; and Schweisser, Bernd, 4,411,115., Cl. 52-309.100.
Valsamis, Lefteris N.; Yang, Jan-Chin; and Donoian, Gary S., 4,411,532., Cl. 366-99.000.

Utsumi, Yoshikazu: *See—*
Ishii, Isao; Murakami, Tadaki; Sakamoto, Yoshiaki; Utsumi, Yoshikazu; Nakamura, Tatsuharu; and Takayanagi, Hiroshi, 4,412,010., Cl. 501-153.000.

Uzuka, Mitsuo, to Sony Corporation. Drive circuit for an alternate phase brushless DC motor. 4,412,159., Cl. 318-254.000.

V. M. Chasovoi: *See—*
Denisov, Vladimir A.; Kulevskaya, Elena F.; Zhiltsov, Jury S.; Kuznetsova, Olga M.; Novakovskaya, Zoya D.; Kozlov, Vyacheslav I.; Korol, Vyacheslav K.; and Pershin, Nikolai I., 4,412,144., Cl. 310-49.00R.

Valadier, Jean-Claude, to Testut Aequitas. Gauge wire dynamometer wound and connected in an electrical bridge arrangement. 4,411,162., Cl. 73-862.650.

Valeas S.p.A.: *See—*
Bernareggi, Virgilio; Margutti, Roberto; Bonifacio, Fausto; and Fano, Maurizio, 4,411,902., Cl. 424-265.000.

Valenti, James P., to Armstrong World Industries, Inc. Overrunning synchronizable clutch and apparatus for treating work pieces in register with a physical characteristic thereof. 4,411,217., Cl. 118-212.000.

Valsamis, Lefteris N.; Yang, Jan-Chin; and Donoian, Gary S., to USM Corporation. Rotary processor. 4,411,532., Cl. 366-99.000.

Vanderbilt University: *See—*
Mann, George V., 4,411,916., Cl. 426-43.000.

Van Driesen, Roger P.: *See—*
Unger, Harold; Sze, Morgan C.; and Van Driesen, Roger P., 4,411,768., Cl. 208-59.000.

Van Eenam, Donald N., to Monsanto Company. Compositions for bonding fibrous substrates. 4,412,017., Cl. 523-408.000.

van Gogh, Johan; and Grol, Hermanus, to Shell Oil Company. Polyglycidyl ethers, their preparation and use in curable compositions. 4,412,056., Cl. 528-112.000.

Van Lue, Dorin F.: *See—*
Petrini, Richard R.; and Van Lue, Dorin F., 4,412,177., Cl. 324-226.000.

van Ommering, Gerrit: *See—*
Meyer, Theodore O.; and van Ommering, Gerrit, 4,411,970., Cl. 429-161.000.

van Peppen, Jacobus C. L.: *See—*
Asjes, Ronald J.; van Peppen, Jacobus C. L.; and Klaassen, Klaas B., 4,412,317., Cl. 367-185.000.

Varian Associates, Inc.: *See—*
Kalbfus, Charles R.; and Turner, Norman L., 4,412,153., Cl. 315-111.810.

Vaulont, Winfrid: *See—*
Schnabel, Roland; Hoelzel, Alexander; and Vaulont, Winfrid, 4,411,781., Cl. 210-195.200.

Veillon, Armas. Wood working jointer device. 4,411,297., Cl. 144-129.000.

Venable, D. L. Apparatus for screening grain or the like. 4,411,778., Cl. 209-246.000.

Vereinigte Flugtechnische Werke GmbH: *See—*
Hubner, Rudolf; and Grabenhorst, Rolf, 4,411,483., Cl. 339-17.00M.

Verhaeghe, Michel: *See—*
Froment, Jean-Claude; Marijon, Jean-Louis; Orengo, Gerard; and Verhaeghe, Michel, 4,412,335., Cl. 375-3.000.

Ver Nooy, Burton, to T. D. Williamson, Inc. Branch fitting for providing access to the interior of a pipe. 4,411,459., Cl. 285-197.000.

Vetrotex Saint-Gobain: *See—*
Roncato, Giordano, 4,411,180., Cl. 83-37.000.

Victor Company of Japan, Ltd.: *See—*
Hiraguri, Seisuke, 4,412,259., Cl. 360-77.000.
Ishigaki, Yukinobu; Totsuka, Kaoru; Yamamoto, Makoto; and Miyaji, Naotaka, 4,412,097., Cl. 381-92.000.

Viebranz, Manfred: *See—*
Kehr, Dieter; and Viebranz, Manfred, 4,412,029., Cl. 524-441.000.

Vig, John R., to United States of America, Army. Method of measuring the thermal properties of a resonator. 4,412,172., Cl. 324-56.000.

Vigil, Thomas R.: *See—*
Holmes, George; and Keyser, Frank, 4,411,531., Cl. 366-76.000.

Villa-Komaroff, Lydia J.: *See—*
Gilbert, Walter; Broome, Stephanie A.; Villa-Komaroff, Lydia J.; and Efstratiadis, Argiris A., 4,411,994., Cl. 435-71.000.

Vines, Harvey L.: *See—*
Pervier, James W.; Vines, Harvey L.; Marano, Vincent, III; and Patterson, Michael A., 4,411,677., Cl. 62-25.000.

Vitrum AB: *See—*
Bennwik, Percy; and Hjertman, Birger, 4,411,358., Cl. 206-45.340.

Vittadini, Italo: *See—*
Guerriero, Renato; and Vittadini, Italo, 4,411,760., Cl. 204-270.000.

Vitzthum, Otto: *See—*
Hubert, Peter; and Vitzthum, Otto, 4,411,923., Cl. 426-271.000.

Voegele, Jean D.; Jourdheuil, Pierre E. J.; and Daumal, Jeanne, to Inst. Nat. de la Recherche Agronomique. Mass production unit for producing eggs of an insect. 4,411,220., Cl. 119-1.000.

Voest-Alpine Aktiengesellschaft: *See—*
Aschauer, Hans; and Funk, Gunter, 4,411,148., Cl. 72-306.000.
Cordella, Johannes, 4,411,304., Cl. 164-448.000.
Kriegner, Othmar; and Gruber, Gunther, 4,411,534., Cl. 374-141.000.
Scheurecker, Werner, 4,411,053., Cl. 29-267.000.

Vogelgesang, Herbert, to Mannesmann Aktiengesellschaft. Wire rolling mill in block form, a so-called wire block with at least one driven line shaft. 4,411,170., Cl. 74-661.000.

Voights, Dora L. Palpation and auscultation teaching method and apparatus. 4,411,629., Cl. 434-266.000.

Voisin, Max. Process for emulsifying and stabilizing anise essences, anethole and essential oils or fats in the aqueous phase. 4,411,813., Cl. 252-312.000.

Voith Getriebe KG: *See—*
Brosius, Klaus; and Herrmann, Berthold, 4,411,340., Cl. 188-296.000.

Volfson, Boris, to Graber Industries, Inc. Cord weight pulley. 4,411,044., Cl. 16-219.000.

Volkswagenwerk Aktiengesellschaft: *See—*
Fiala, Ernest, 4,411,171., Cl. 74-675.000.

von Bonin, Wulf; von Gizycki, Ulrich; Wagner, Kuno; and Schapel, Dietmar, to Bayer Aktiengesellschaft. Constructional material. 4,411,262., Cl. 128-90.000.

von Borstel, Klaus P.: *See—*
Heinzl, Joachim; and von Borstel, Klaus P., 4,412,256., Cl. 358-283.000.

von Gizycki, Ulrich: *See—*
von Bonin, Wulf; von Gizycki, Ulrich; Wagner, Kuno; and Schapel, Dietmar, 4,411,262., Cl. 128-90.000.

Von Kemenczky, Miklos, to Guilden Development Corp. Switch construction responsive to motions of a wearer. 4,412,205., Cl. 340-331.000.

von Renteln, Adrian, to ASEA Aktiebolag. Regulating winding connected in series with a main winding of a transformer. 4,412,199., Cl. 336-70.000.

Vorreiter, John W.: *See—*
Eckes, William A.; Rhoades, Russell H.; Vorreiter, John W.; Wiesner, John C.; and Shepard, Charles E., 4,412,133., Cl. 250-492.200.

Voss, Erich; and Grafenschnell, Horst, to Siemens Aktiengesellschaft. Stator for an electric machine excited by permanent magnets. 4,412,145., Cl. 310-154.000.

Vought Corporation: *See—*
Johnson, Robert M., 4,411,962., Cl. 428-615.000.

Voyda, Ronald A.: *See—*
Stedman, Thomas R.; and Voyda, Ronald A., 4,411,349., Cl. 193-35.00R.

Vulcan Materials Company: *See—*
Beard, William Q., Jr.; and Wilson, Richard L., 4,412,086., Cl. 570-262.000.

W. Braun Company: *See—*
Wavering, Karen A., 4,411,282., Cl. 132-88.500.

W. G. Durant Corporation: *See—*
Durant, Will G., 4,411,296., Cl. 141-98.000.

W. H. Brady Co.: *See—*
Frame, Norman J.; Walber, James P.; and Janick, Jan M., 4,412,209., Cl. 340-365.00C.

W. L. Gore & Associates, Inc.: *See—*
Hansell, George A., III, 4,412,092., Cl. 174-36.000.

W. R. Grace & Co.: *See—*
Green, Peter C.; and Block, Jacob, 4,411,800., Cl. 252-8.50A.

W. R. Grace & Co., Cryovac Division: *See—*
Thompson, Henry B., 4,411,919., Cl. 426-412.000.

Wachs, Edward H.; and Kwech, Horst, to Power Cutting Incorporated. Pipe end preparation machine. 4,411,178., Cl. 82-4.00C.

Wada, Minoru; and Yoshida, Satoshi, to Fuji Photo Film Co., Ltd. Line recording method. 4,412,229., Cl. 346-108.000.

Wada, Tomio: *See—*
Nonomura, Keisaku; Matsura, Masataka; and Wada, Tomio, 4,411,496., Cl. 350-347.00E.

Wagner, Kuno: *See—*
von Bonin, Wulf; von Gizycki, Ulrich; Wagner, Kuno; and Schapel, Dietmar, 4,411,262., Cl. 128-90.000.

Wakabayashi, Hiroharu: *See—*
Mochizuki, Kiyofumi; Wakabayashi, Hiroharu; and Niiro, Yasuhiko, 4,411,520., Cl. 356-73.100.

Wakabayashi, Takeshi: *See—*
Matsuura, Yoshio; Kurihara, Michio; Kamei, Takao; Nakamura, Akira; Komai, Keiichi; and Wakabayashi, Takeshi, 4,411,765., Cl. 208-8.0LE.

Walber, James P.: *See—*
Frame, Norman J.; Walber, James P.; and Janick, Jan M., 4,412,209., Cl. 340-365.00C.

Walde, Robert A.: *See—*
Cebalo, Tony; and Walde, Robert A., 4,412,079., Cl. 548-141.000.

Walden, Jack M.: *See—*
Watson, Robert E.; Walden, Jack M.; and Near, Charles W., 4,412,300., Cl. 364-709.000.

Waldron, Wesley K., to General Electric Company. Method for forming electrical contacts between a conductor-carrying cable and a display cell. 4,411,633., Cl. 445-24.000.

Walgreen Co.: *See—*
Stedman, Thomas R.; and Voyda, Ronald A., 4,411,349., Cl. 193-35.00R.

Walker, Brooks. Carrier for garment bags and the like. 4,411,344., Cl. 190-18.00A.

Walker, George L.: *See—*
LaVanture, Mark D.; and Walker, George L., 4,411,811., Cl. 252-182.000.

Walker, Jerry A.; and Hessler, Edward J., to Upjohn Company, The. Preparation of corticoids from 17-keto steroids. 4,411,835., Cl. 260-397.450.

Walker, Lois J. Holder for skeins of embroidery floss. 4,411,363., Cl. 206-388.000.

Wallace, Harry L.; and Thomas, John D., to Burroughs Corporation. Method and apparatus for eliminating dust from ink jet printers. 4,411,706., Cl. 134-37.000.

Wallis, Christopher N.: *See—*
Case, William J.; and Wallis, Christopher N., 4,412,165., Cl. 318-636.000.

Walt, Davis R.: *See—*
Whitesides, George; and Walt, Davis R., 4,411,995., Cl. 435-90.000.

Walter Dian, Inc.: *See—*
Dian, Walter, 4,411,430., Cl. 273-171.000.

Walter, Lothar: *See—*
Olschewski, Armin; Brandenstein, Manfred; Walter, Lothar; and Ernst, Horst M., 4,411,478., Cl. 308-6.00C.

Walters, Ronald B., to Sperry Limited. Hydraulic valve. 4,411,289., Cl. 137-486.000.

Walz, Gerd: *See—*
Mondt, Josef; Walz, Gerd; and Wirth, Thaddaus, 4,411,955., Cl. 428-413.000.

Wang, Jia T.: *See—*
Khadder, Wadie N.; Wang, Jia T.; and Hollins, Brian E., 4,412,238., Cl. 357-43.000.

Wang Laboratories, Inc.: *See—*
Nelson, Alfred M.; Rasekhi, Houshang; and Cieplik, Ronald J., 4,412,263., Cl. 360-128.000.

Ward, Denis S., to British Petroleum Company, p.l.c., The. Separation equipment. 4,411,791., Cl. 210-649.000.

Ward, Roger W.: *See—*
Workman, S. Thomas; Chambers, John L.; Pugh, Myron A.; and Ward, Roger W., 4,412,345., Cl. 378-078.000.

Warman, Thomas E., to Senco Products, Inc. Disposable surgical stapling instrument having an anvil with coextensive lateral flanges. 4,411,378., Cl. 227-19.000.

Warner-Lambert Company: *See—*
Pattison, Ian C., 4,411,904., Cl. 424-267.000.

Warren, Michael M.: *See—*
Davis, Charles P.; Warren, Michael M.; and Arnett, David W., 4,411,648., Cl. 604-21.000.

Washizawa, Yasuo; Shinozaki, Fumiaki; Ikeda, Tomoaki; and Nakao, Sho, to Fuji Photo Film Co., Ltd. Method for processing an image-forming material. 4,411,983., Cl. 430-325.000.

Washizuka, Isamu; and Hashimoto, Shintaro, to Sharp Kabushiki Kaisha. Electronic calculator with acoustic confirmation of key actuation and acoustical alarms. 4,412,210., Cl. 340-365.00S.

Watanabe, Kazuo: *See—*
Mochizuki, Masataka; Takaoka, Michio; Moutai, Tsuneaki; Yoshida, Shotaro; and Watanabe, Kazuo, 4,411,710., Cl. 148-6.14R.

Watanabe, Kiyoshi: *See—*
Hirakawa, Kan; Takakuma, Ryoji; Nomura, Koji; Katoh, Masami; and Watanabe, Kiyoshi, 4,411,991., Cl. 435-42.000.

Watanabe, Shunso F.; Daykin, Theodore W.; and Heiney, Elmer T., III, to Ford Motor Company. Carburetor throttle valve actuator. 4,411,231., Cl. 123-339.000.

Watanabe, Taisuke: *See—*
Niyada, Katsuyuki; Watanabe, Taisuke; Hiraoka, Shoji; and Morii, Shuji, 4,412,099., Cl. 381-51.000.

Watanabe, Toshiyuki: *See—*
Kobayashi, Hidetoshi; Watanabe, Toshiyuki; Adachi, Keiichi; and Ogawa, Tadashi, 4,411,987., Cl. 430-542.000.

Watanabe, Yasuo; Isoyama, Seiji; and Bannou, Masahiko, to Dowa Mining Co., Ltd. Dry process for the production of hexagonal-system ferrite. 4,411,807., Cl. 252-62.580.

Watson, Martin C.: *See—*
Neches, Philip M.; Hartke, David H.; Stockton, Richard C.; Watson, Martin C.; Cronshaw, David; and Shemer, Jack E., 4,412,285., Cl. 364-200.000.

Watson, Robert E.; Walden, Jack M.; and Near, Charles W., to Hewlett-Packard Company. Programmable calculator including alphabetic output capability. 4,412,300., Cl. 364-709.000.

Watts, Kenneth H.: *See—*
Pomerleau, Daniel G.; Slocombe, Douglas E.; and Watts, Kenneth H., 4,411,801., Cl. 252-8.50P.

Watts, LaVaughn F.; Smith, Ronald L.; Pandya, Yogendra C.; and Wood, Paul B., to Texas Instruments Incorporated. Display system with multiple scrolling regions. 4,412,294., Cl. 364-518.000.

Wavering, Karen A., to W. Braun Company. Mascara applicator wand and receptacle. 4,411,282., Cl. 132-88.500.

Wavetek Indiana, Inc.: *See—*
Goldberg, Paul R., 4,412,230., Cl. 346-110.00R.

Wean United, Inc.: *See—*
Betts, William H., 4,411,713., Cl. 148-35.000.

Webasto-Werk W. Baier GmbH & Co.: *See—*
Lamkewitz, Falk, 4,411,385., Cl. 237-2.00A.

Webb, Charles M.: *See—*
O'Connor, Brendan F.; Phillips, John O.; and Webb, Charles M., 4,411,522., Cl. 356-240.000.

Weber, Helmut; Reitberger, Peter H.; Bader, Leonhard; and Konig, Walter, to NCR Corporation. Ink jet printer. 4,412,232., Cl. 346-140.00R.

Wecker, Sheldon M.: *See—*
Kohl, Lou; Peschke, John R.; and Wecker, Sheldon M., 4,411,849., Cl. 264-45.500.

Wedertz, Larry D.; Ross, Oakley G.; and Niemeier, Byron M., to General Dynamics, Pomona Division. Double fabric retractable wing construction. 4,411,398., Cl. 244-3.280.

Wedertz, Larry D.; and Ross, Oakley G., to General Dynamics, Pomona Division. Flexible printed circuit card assembly. 4,412,272., Cl. 361-383.00U.

Weiden, Horst: *See—*
Becker, Gunter; and Weiden, Horst, 4,411,626., Cl. 433-223.000.

Weikert, Norbert B.: *See—*
Best, Gerd; and Weikert, Norbert B., 4,411,475., Cl. 299-81.000.

Weintraub, Ronald, to Flexnit Company, Inc. Front opening bra with adjustable back. 4,411,269., Cl. 128-482.000.

Weir, Henry J., to H. J. Weir Engineering Co., Ltd. Laundry spreader. 4,411,083., Cl. 38-143.000.

Weisbach, Albert P., to Cardinal Manufacturing Co. Holding clips for stakes supporting metal concrete forms. 4,411,404., Cl. 249-3.000.

Weiss, Andrew B.: *See—*
Alexander, Harold; Parsons, John R.; Strauchler, Irving D.; and Weiss, Andrew B., 4,411,027., Cl. 3-1.000.

Weitz, Paul G., Jr.; and Franklin, Cecil, to Simmonds Precision Products, Inc. Electrode assembly for a capacitance type probe. 4,412,270., Cl. 361-284.000.

Welbourn, Brian C.: *See—*
Spenceley, Gene D.; and Welbourn, Brian C., 4,411,697., Cl. 75-60.000.

Welebir, Andrew J., to Biochemical Research Corporation. 1-Triacontanol plant growth stimulator formulations. 4,411,685., Cl. 71-84.000.

Welsch, Walter N.: *See—*
Fleckenstein, Elwin H.; and Welsch, Walter N., 4,411,106., Cl. 51-170.0EB.

Welsh, Jay Y., to Chemetals Incorporated. Preparation of Mn_3O_4. 4,411,878., Cl. 423-605.000.

Wenderoth, Karl; and Kuhn, Lothar, to Triumph-Adler A. G. fur Buro-und Informationstechnik. Error ribbon elevation and transport mechanism for typewriters and similar machines. 4,411,542., Cl. 400-697.100.

Wenderoth, Karl: *See—*
Mansfeld, Manfred; and Wenderoth, Karl, 4,411,541., Cl. 400-213.000.

Wessel, Walter F., III: *See—*
Moore, Robert S.; and Wessel, Walter F., III, 4,412,252., Cl. 358-160.000.

Weste, Neil H. E.: *See—*
Ackland, Bryan D.; and Weste, Neil H. E., 4,412,313., Cl. 365-221.000.

Western Electric Co., Inc.: *See—*
Cho, Kon H., 4,411,060., Cl. 29-576.00W.
Dougherty, Timothy S.; Kissell, John J.; and Schmehl, Glenn L., 4,412,094., Cl. 174-110.00F.
Fox, William B.; and Maddox, Harry L., 4,412,327., Cl. 371-21.000.

Westfalia Separator AG: *See—*
Tenthoff, Aloys, 4,411,645., Cl. 494-3.000.

Westinghouse Electric Corp.: *See—*
Braginski, Aleksander I.; and Male, Alan T., 4,411,959., Cl. 428-558.000.
Dixon, George D.; Carlson, Nancy W.; and Saunders, Howard E., 4,412,048., Cl. 525-524.000.
Golub, Gregory J., 4,412,116., Cl. 200-155.00R.
Lindberg, Frank A., 4,411,719., Cl. 156-64.000.

Wevers, Jan H.: *See—*
Mulder, Nicolaas; Terlouw, Willem; and Wevers, Jan H., 4,412,089., Cl. 585-645.000.

Wheelock, Kenneth S.: *See—*
Schucker, Robert C.; and Wheelock, Kenneth S., 4,411,772., Cl. 208-121.000.

White, Fred K., to American Hospital Supply Corporation. Ventable sample collection device. 4,411,163., Cl. 73-864.020.

White, Kendall D., Jr.: *See—*
Wittrup, Bruce A.; and White, Kendall D., Jr., 4,411,738., Cl. 162-142.000.

Whitehouse, Daniel L., to Solarex Corporation. Composition for applying antireflective coating on solar cell. 4,411,703., Cl. 106-189.000.

Whitesides, George; and Walt, Davis R., to Massachusetts Institute of Technology. Synthesis of nicotinamide cofactors. 4,411,995., Cl. 435-90.000.

Whitmire Research Laboratories, Inc.: *See—*
Stout, Daniel M.; and Duff, Charles B., 4,411,093., Cl. 43-114.000.

Wickmann-Werke AG: *See—*
Behrendt, Martin, 4,411,486., Cl. 339-147.00R.

Wiedmann, Siegfried K.: *See—*
Berger, Horst H.; and Wiedmann, Siegfried K., 4,412,312., Cl. 365-189.000.

Wiesner, John C.: *See—*
Eckes, William A.; Rhoades, Russell H.; Vorreiter, John W.; Wiesner, John C.; and Shepard, Charles E., 4,412,133., Cl. 250-492.200.

Wik Elektro-Hausgerate Vertriebsgesellschaft mbH & Co., Productions-KG: *See—*
Doern, Klaus, 4,411,281., Cl. 132-37.00R.

Wild, Peter; and Nickel, Horst, to Bayer Aktiengesellschaft. Processes for dyeing paper, and agents containing azo dyestuffs. 4,411,669., Cl. 8-654.000.

Wildeboer, Nicolaas, to Isotronics, Inc. Microcircuit flat pack with integral shell. 4,412,093., Cl. 174-52.0FP.

Wilhelm, James H.: *See—*
Butler, Robert S.; Claerbout, Paul F.; Kent, Louis P.; Cleland, Randy S.; Wilhelm, James H.; and Micko, Richard E., 4,411,875., Cl. 423-242.000.

Wilkinson, Horace A. Shoe construction. 4,411,076., Cl. 36-34.00R.

Willard, David F.; and Tidwell, Gerald W., to Motorola, Inc. Pager with visible display indicating status of memory. 4,412,217., Cl. 340-825.440.

Willem, Michel: *See—*
Thuillier, Denis; and Willem, Michel, 4,412,095., Cl. 174-158.00R.

William I. Smith: *See—*
Smith, William I.; and Moyer, Harold, 4,411,576., Cl. 414-226.000.

Williams, Althea M. W. Blanket device with alarm. 4,411,034., Cl. 5-494.000.

Williams, Robert E., to General Electric Company. Methods for preparing decamethyl cyclopentasiloxane. 4,412,081., Cl. 556-460.000.

Williams, Robert E., Jr., to General Electric Company. Methods for preparing cyclopolysiloxanes. 4,412,080., Cl. 556-460.000.

Williamson, Richard D.: *See—*
Philipps, Donald F.; and Williamson, Richard D., 4,411,453., Cl. 285-18.000.

Wilnai, Dan: *See—*
Mor, Yeshayahu; and Wilnai, Dan, 4,412,283., Cl. 364-200.000.

Wilson, Hugh R. Water resistant charge container for firearms. 4,411,088., Cl. 42-90.000.

Wilson, Leslie B., to Dayco Corporation. Belt tensioner and method of making the same. 4,411,638., Cl. 474-138.000.

Wilson, Richard L.: *See—*
Beard, William Q., Jr.; and Wilson, Richard L., 4,412,086., Cl. 570-262.000.

Winhan, Lucien C., to TRW Inc. Method of making precision doped polysilicon vertical ballast resistors by multiple implantations. 4,411,708., Cl. 148-1.500.

Winters, Warren J., to Standard Oil Company. Downhole device to detect differences in fluid density. 4,412,130., Cl. 250-260.000.

Wirth, Friedrich: *See—*
Reuter, Peter; Blechschmitt, Kurt; and Wirth, Friedrich, 4,411,818., Cl. 502-35.000.

Wirth, Thaddaus: *See—*
Mondt, Josef; Walz, Gerd; and Wirth, Thaddaus, 4,411,955., Cl. 428-413.000.

Wisconsin Alumni Research Foundation: *See—*
DeLuca, Hector F.; Tanaka, Yoko; Ikekawa, Nobuo; and Kobayashi, Yoshiro, 4,411,833., Cl. 260-239.55R.

Wiseheart, Ronald W.; and Meyer, Daniel, to Communications Systems, Inc. Wall plate kit for telephones. 4,411,485., Cl. 339-125.00R.

Wishart, John G., to Mead Corporation, The. Apparatus and method for attaching fastener tapes. 4,411,721., Cl. 156-73.100.

Wisian-Neilson, Patty J.: *See—*
Neilson, Robert H.; and Wisian-Neilson, Patty J., 4,412,053., Cl. 528-30.000.

Witt, Ronald A., to Falk Corporation, The. Disc clutch apparatus. 4,411,346., Cl. 192-85.00A.

Wittrup, Bruce A.; and White, Kendall D., Jr., to United States Gypsum Company. Press cycle reduction for wet pressed hardboard. 4,411,738., Cl. 162-142.000.

Wixon, Harold E., to Colgate Palmolive Company. Detergent softener compositions. 4,411,803., Cl. 252-8.750.

Wixon, Harold E., to Colgate Palmolive Company. Concentrated heavy duty particulate laundry detergent. 4,411,809., Cl. 252-91.000.

Woerz, Stephen E.; and Canup, Travis K., to Boise Cascade Corporation. Apparatus for spin bonding ends for composite containers. 4,411,726., Cl. 156-423.000.

Wojtanek, Guy A., to Singer Company, The. Timer clutch. 4,412,110., Cl. 200-38.00R.

Woldy, Paul N.: *See—*
Loftus, Jordan; and Woldy, Paul N., 4,411,533., Cl. 374-125.000.

Wolfram, Frank. Reversing conveyer track. 4,411,350., Cl. 193-35.00A.

Wolfson, Morton M. Safety apparatus for passengers on vehicles. 4,411,222., Cl. 119-96.000.

Wollam, Carl A.; Gailey, J. Lynn; and Chalmers, Alexander F., to Alcan Aluminum Corporation. Apparatus for producing straited surface coatings. 4,411,218., Cl. 118-411.000.

Wollam, Carl A.: *See—*
Gailey, J. Lynn; and Wollam, Carl A., 4,411,215., Cl. 118-111.000.

Wood, Dale A.; and Elfes, Lee E., to Massey-Ferguson Inc. Sensitivity adjusting apparatus for tractor draft sensing and control system. 4,411,319., Cl. 172-10.000.

Wood, Obert R., II: *See—*
Macklin, John J.; Silfvast, William T.; and Wood, Obert R., II, 4,411,733., Cl. 156-643.000.

Wood, Paul B.: *See—*
Watts, LaVaughn F.; Smith, Ronald L.; Pandya, Yogendra C.; and Wood, Paul B., 4,412,294., Cl. 364-518.000.

Woodruff, Richard E., to TransFRESH Corporation. Method for inhibiting fungal growth on fresh fruits and vegetables. 4,411,921., Cl. 426-263.000.

Woodward, Ronald O.: *See—*
McMahan, David R.; and Woodward, Ronald O., 4,412,274., Cl. 362-269.000.

Wooten, John T.: *See—*
Easley, Othel D., Jr.; and Wooten, John T., 4,411,705., Cl. 134-8.000.

Workman, S. Thomas; Chambers, John L.; Pugh, Myron A.; and Ward, Roger W., to United States of America, Army. Apparatus and method for precise determinations of crystallographic orientation in crystalline substances. 4,412,345., Cl. 378-078.000.

Works, George A., to Raytheon Company. Distributed signal processing system. 4,412,281., Cl. 364-200.000.

Woten, Homer G. Insulation blowing and spraying apparatus. 4,411,390., Cl. 241-98.000.

Wotherspoon, John T. M., to U.S. Philips Corporation. Method of manufacturing a detector device. 4,411,732., Cl. 156-643.000.

Wright, Charles S., to Delta Electronics, Inc. Remote display of percentage modulation data obtained at a transmitter site. 4,412,349., Cl. 455-67.000.

Wright, Kenneth W.: *See—*
Hersom, Albert C.; and Wright, Kenneth W., 4,411,601., Cl. 417-388.000.

Wright, Richard A.: *See—*
Sedam, Jason K.; Hale, James V. M.; Caldwell, Stewart W.; Bushman, Willard T.; and Wright, Richard A., 4,412,292., Cl. 364-479.000.

Wright, Thad F., to Agricultural Computer Systems, Inc. Apparatus and method for monitoring the oestrus cycle in female animals. 4,411,274., Cl. 128-738.000.

Wroblewski, Jerome J.: *See—*
Klein, Dean A.; Davis, Steven C.; and Wroblewski, Jerome J., 4,411,150., Cl. 72-461.000.

Wrozina, Joseph I.: *See*—
Albee, Paul J., Jr.; Burdick, Patricia E.; and Wrozina, Joseph I., 4,412,040., Cl. 525-143.000.

Wu, Mu-Yen M.; and Ball, Lawrence E., to Standard Oil Company, The. Process for the preparation of a polyamide from unsaturated nitrile, lactam and water. 4,412,061., Cl. 528-315.000.

Wu, Tai-Wing, to Eastman Kodak Company. Determination of total bilirubin. 4,412,005., Cl. 436-97.000.

Wuenscher, Hans F., deceased; and Wuenscher, Hertha A., administratrix. Waterbound facility powered by cycloidal fluid flow engines. 4,411,632., Cl. 440-93.000.

Wuenscher, Hertha A., administratrix: *See*—
Wuenscher, Hans F., deceased; and Wuenscher, Hertha A., administratrix, 4,411,632., Cl. 440-93.000.

Wuerzer, Bruno: *See*—
Rohr, Wolfgang; Hansen, Hanspeter; Wuerzer, Bruno; and Ceser, Heinz-Guenter, 4,411,691., Cl. 71-92.000.

Wunsch, Gerd: *See*—
Roos, Hans; Boehn, Hugo; Bittler, Knut; Kiener, Volker; and Wunsch, Gerd, 4,411,761., Cl. 204-290.00R.

Wurtinger, Horst; Glissmann, Jochen; and Heissler, Herbert, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Compression-tension strut. 4,411,114., Cl. 52-309.100.

Wusthof, Peter; and Schneider, Johann, to G. L. Rexroth GmbH. Internal gear machine with rotary pressure balanced valve disc. 4,411,607., Cl. 418-61.00B.

Xerox Corporation: *See*—
Badesha, Santokh S., 4,411,698., Cl. 75-121.000.
Browne, John M., 4,411,417., Cl. 271-94.000.
Gerken, William G., 4,411,517., Cl. 355-14.0SH.
Kukucka, William P.; Hynes, Frank R.; Jones, Hugh L.; and Thompson, David M., 4,411,515., Cl. 355-14.0SH.
Lu, Chin H.; Au Clair, Christopher J.; and Erhardt, Peter F., 4,411,974., Cl. 430-106.000.
Lu, Chin H.; and Au Clair, Christopher J., 4,411,975., Cl. 430-106.000.
Poehlein, Raymond E., 4,411,418., Cl. 271-236.000.

Yamabe, Masaaki; Kato, Masao; and Takakura, Teruo, to Asahi Glass Company Ltd. Antithrombogenic polyurethanes based on fluorinated prepolymers. 4,412,054., Cl. 528-70.000.

Yamada Electric Manufacturing Company Ltd.: *See*—
Niino, Masahiko, 4,412,266., Cl. 361-24.000.

Yamada, Shin: *See*—
Mutsukado, Motoo; and Yamada, Shin, 4,412,082., Cl. 562-478.000.

Yamada, Yasutsugu: *See*—
Shimazaki, Keishi; Nakamura, Yoshihiro; and Yamada, Yasutsugu, 4,411,997., Cl. 435-115.000.

Yamaguchi, Masaharu: *See*—
Makino, Yoshio; Murata, Yoshihiko; Kakinuma, Toshiaki; Yamaguchi, Masaharu; and Fujisawa, Naoyuki, 4,411,702., Cl. 106-111.000.

Yamaguchi, Nobutaka; Tsuji, Nobuo; Okuzawa, Yasutoshi; Nasu, Norio; and Fujiyama, Masaaki, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,411,966., Cl. 428-695.000.

Yamaguchi, Shoichiro; and Kabayashi, Fujio, to Tokyo Institute of Technology, The President of. Reconstruction method of X-ray computed tomography. 4,412,289., Cl. 364-414.000.

Yamaguchi, Toshihiro: *See*—
Nishino, Takao; Yamaguchi, Toshihiro; and Tanaka, Kazunori, 4,412,213., Cl. 340-753.000.

Yamaguchi, Yuji: *See*—
Kawai, Shinji; Suzuki, Koichi; and Yamaguchi, Yuji, 4,411,030., Cl. 4-443.000.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Horiuchi, Kotaro, 4,411,214., Cl. 114-347.000.
Taguchi, Michihiro, 4,411,593., Cl. 415-173.00R.

Yamakawa, Akio, to Sony Corporation. Releasable cover locking device. 4,412,320., Cl. 369-79.000.

Yamakita, Tooru, to Casio Computer Co., Ltd. Electronic cash register. 4,412,304., Cl. 364-900.000.

Yamamichi, Masayoshi: *See*—
Kinoshita, Takao; Hosoe, Kazuya; and Yamamichi, Masayoshi, 4,411,504., Cl. 354-25.000.

Yamamoto, Hiroshi: *See*—
Kitada, Masahiro; Suenaga, Masahide; Tsukada, Yukihisa; Shimizu, Noboru; and Yamamoto, Hiroshi, 4,411,757., Cl. 204-192.00E.

Yamamoto, Makoto: *See*—
Ishigaki, Yukinobu; Totsuka, Kaoru; Yamamoto, Makoto; and Miyaji, Naotaka, 4,412,097., Cl. 381-92.000.

Yamanaka, Kazusuke; and Mochizuki, Shouji, to Hitachi, Ltd. Electrochromic display element. 4,411,497., Cl. 350-357.000.

Yamaoka, Noboru: *See*—
Matsuura, Kazuo; Yamaoka, Noboru; and Miyoshi, Mituji, 4,412,042., Cl. 525-260.000.

Yamashita, Masaki: *See*—
Hara, Tomihiro; Ogawa, Masahiro; Tsukada, Masakazu; and Yamashita, Masaaki, 4,411,964., Cl. 428-626.000.

Yamashita, Sadahiko: *See*—
Onishi, Hiroshi; Yamashita, Sadahiko; and Makimoto, Mitsuo, 4,412,351., Cl. 455-317.000.

Yamazaki, Etsuo: *See*—
Imazeki, Ryoji; and Yamazaki, Etsuo, 4,412,295., Cl. 364-520.000.

Yan, Tsoung-Yuan, to Mobil Oil Corporation. In-line regeneration of polythionate poisoned ion exchange resins. 4,411,873., Cl. 423-7.000.

Yanagihara, Hiromichi: *See*—
Igashira, Toshihiko; Tanaka, Takeshi; Sekiguchi, Kiyonori; and Yanagihara, Hiromichi, 4,411,242., Cl. 123-569.000.

Yanagihara, Noritaka: *See*—
Yokoi, Takeshi; and Yanagihara, Noritaka, 4,411,174., Cl. 74-866.000.

Yanagisawa, Zensuke, to Kawasaki Electric Wire Co., Ltd. Automatic apparatus for transferring electrical cords with terminal blades and for the testing thereof. 4,411,608., Cl. 425-123.000.

Yang, Jan-Chin: *See*—
Valsamis, Lefteris N.; Yang, Jan-Chin; and Donovan, Gary S., 4,411,532., Cl. 366-99.000.

Yang, Lian T., to Hallmark Camera Mfg. Pte. Ltd. Photographic camera. 4,411,506., Cl. 354-145.000.

Yano, Masao, to Mitsubishi Denki Kabushiki Kaisha. Cell generating system. 4,411,967., Cl. 429-23.000.

Yarborough, John M., Jr., to SRI International. Parity bit lock-on method and apparatus. 4,412,329., Cl. 371-47.000.

Yasuda, Yoshinobu: *See*—
Kimata, Kei; Nakazeki, Tsugito; and Yasuda, Yoshinobu, 4,411,244., Cl. 123-389.000.

Yasuoka, Hirotoshi, to Mitsubishi Denki Kabushiki Kaisha. Limit switch mechanism. 4,412,111., Cl. 200-47.000.

Yates, Patrick A.; and McInnis, Patrick M., to United States of America, Navy. Booster for missile fuze with cylindrical wall holes. 4,411,199., Cl. 102-481.000.

Yavitz, Edward Q.: *See*—
Kramer, Steven G.; and Yavitz, Edward Q., 4,411,652., Cl. 604-153.000.

Yazawa, Hiroshi: *See*—
Yazawa, Masahide, deceased; Yazawa, Hiroshi, executor; Kurihara, Kazuhiko; Yazawa, Hiroshi; Kuroiwa, Yuki; and Murakami, Shuichi, 4,411,722., Cl. 156-167.000.

Yazawa, Hiroshi, executor: *See*—
Yazawa, Masahide, deceased; Yazawa, Hiroshi, executor; Kurihara, Kazuhiko; Yazawa, Hiroshi; Kuroiwa, Yuki; and Murakami, Shuichi, 4,411,722., Cl. 156-167.000.

Yazawa, Masahide, deceased; by Yazawa, Hiroshi, executor; Kurihara, Kazuhiko; Yazawa, Hiroshi; Kuroiwa, Yuki; and Murakami, Shuichi, to Polymer Processing Research Institute Ltd. Method for producing a non-woven fabric of cross-laminated warp and weft webs of elongated stocks. 4,411,722., Cl. 156-167.000.

Yen, Teh F.; and Farmanian, Paul A., to University of Southern California, The. Native petroleum surfactants. 4,411,816., Cl. 252-356.000.

Yevich, Joseph P.: *See*—
Temple, Davis L., Jr.; and Yevich, Joseph P., 4,411,901., Cl. 424-250.000.

Yochum, Billy G., to Harris Corporation. Apparatus for controlling an operational characteristic of a controlled device in accordance with the position of a movable member. 4,412,182., Cl. 330-59.000.

Yokoi, Takeshi; and Yanagihara, Noritaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Transmission shift control device. 4,411,174., Cl. 74-866.000.

Yokono, Hitoshi: *See*—
Yoshii, Masaki; Sato, Hidemi; Kaneda, Aizo; Aoki, Masayoshi; Yokono, Hitoshi; and Oka, Mitsunori, 4,411,609., Cl. 425-149.000.

Yoneda, Kanji: *See*—
Kuzunuki, Soshiro; Hirasawa, Kotaro; Yuminaka, Takeo; and Yoneda, Kanji, 4,411,338., Cl. 187-29.00R.

Yonezawa, Kazuya: *See*—
Asada, Masahiro; Matsuura, Miyuki; and Yonezawa, Kazuya, 4,412,057., Cl. 528-179.000.

Yonezawa, Seiji; and Sugiyama, Toshio, to Hitachi, Ltd. Optical system for reproducing information. 4,411,500., Cl. 350-446.000.

Yong, Raymond N.; and Sethi, Amar J., to Suncor, Inc. Rapid method for bitumen analysis. 4,412,007., Cl. 436-139.000.

Yoshida, Hideaki: *See*—
Morikawa, Masaki; Yoshida, Hideaki; Kishida, Kunio; and Tanaka, Chuji, 4,411,864., Cl. 420-587.000.

Yoshida, Kazutaka; and Horiuchi, Hideo, to Fuji Photo Film Co., Ltd. Method for color representation using colored ink dots. 4,412,225., Cl. 346-1.100.

Yoshida, Kazutaka, to Fuji Photo Film Co., Ltd. Ink-jet printing method. 4,412,226., Cl. 346-1.100.

Yoshida Kogyo K. K.: *See*—
Hosooka, Shuichi, 4,411,111., Cl. 52-213.000.

Yoshida, Kunio, to 501 Sharp Kabushiki Kaisha. Sentence translation device. 4,412,305., Cl. 364-900.000.

Yoshida, Masaru: *See*—
Kaetsu, Isao; Yoshida, Masaru; and Kumakura, Minoru, 4,411,754., Cl. 204-159.150.

Yoshida, Satoshi: *See*—
Wada, Minoru; and Yoshida, Satoshi, 4,412,229., Cl. 346-108.000.

Yoshida, Shotaro: *See*—
Mochizuki, Masataka; Takaoka, Michio; Moutai, Tsuneaki; Yoshida, Shotaro; and Watanabe, Kazuo, 4,411,710., Cl. 148-6.14R.

Yoshida, Takao: *See*—
Light, Kenneth K.; McGhie, Joseph A.; Fujioka, Futoshi; and Yoshida, Takao, 4,411,830., Cl. 252-522.00R.
Light, Kenneth K.; Schreiber, William L.; McGhie, Joseph A.; Schreck, Ronald P.; Yoshida, Takao; Schreiber, Loren B.; and Muralidhara, Ranya, 4,412,083., Cl. 564-279.000.

Yoshifuji, Junnosuke, to Nippon Cable System, Inc. Inner cable. 4,411,168., Cl. 74-501.00R.

Yoshii, Masaki; Sato, Hidemi; Kaneda, Aizo; Aoki, Masayoshi; Yokono, Hitoshi; and Oka, Mitsunori, to Hitachi, Ltd. Apparatus for molding plastic. 4,411,609., Cl. 425-149.000.

Yoshioka, Akira: *See*—
Kitahara, Shizuo; Hirokawa, Yoshitsugu; Kawada, Haruki; Fujii, Toshihiro; Sugi, Nagatoshi; Hasegawa, Hiroaki; and Yoshioka, Akira, 4,412,031., Cl. 524-526.000.
Kitahara, Shizuo; Hirokawa, Yoshitsugu; Kawada, Haruki; Fujii, Toshihiro; Sugi, Nagatoshi; Hasegawa, Hiroaki; and Yoshioka, Akira, 4,412,041., Cl. 525-154.000.

Yoshioka, Hiroshi: *See*—
Shiga, Akinobu; Naito, Yukio; Sasaki, Toshio; Kojima, Junpei; and Yoshioka, Hiroshi, 4,412,049., Cl. 526-127.000.

Young, John K.: *See*—
Leithauser, Douglas R.; and Young, John K., 4,411,138., Cl. 62-50.000.

Youngstown Steel Door Company, The: *See*—
McComb, Ronald J., 4,411,560., Cl. 406-128.000.

Yu, Steven P.; Matunas, Frank C.; and Zwetkow, Nikolaus, to Ecodyne Corporation. Reverse osmosis hollow fiber filter element. 4,411,785., Cl. 210-321.100.

Yuminaka, Takeo: *See*—
Kuzunuki, Soshiro; Hirasawa, Kotaro; Yuminaka, Takeo; and Yoneda, Kanji, 4,411,338., Cl. 187-29.00R.

Zeeh, Bernd; Goetz, Norbert; Ammermann, Eberhard; and Pommer, Ernst-Heinrich, to BASF Aktiengesellschaft. α-Azolyl-glycol derivatives, as fungicides and plant growth regulators. 4,411,687., Cl. 71-76.000.

Zeiher, Erich: *See*—
Brede, Uwe; Penner, Horst; Stahlmann, Rudolf; and Zeiher, Erich, 4,411,200., Cl. 102-529.000.

Zeilenga, William. Art of installing a sink drain flange assembly capable of supporting a garbage disposal. 4,411,054., Cl. 29-434.000.

Zeischegg, Walter; and Brussing, Bernd. Fire-extinguishing waste receptacle. 4,411,318., Cl. 169-26.000.

Zenith Radio Corporation: *See*—
Gibson, Kenneth L., 4,411,480., Cl. 312-7.200.

Zerpner, Dieter; and Streck, Roland, to Chemische Werke Huels AG. Low molecular weight 1,3-butadiene polymers containing reactive silyl groups, which are stabilized against crosslinking. 4,412,038., Cl. 525-101.000.

Zhiltsov, Jury S.: *See*—
Denisov, Vladimir A.; Kulevskaya, Elena F.; Zhiltsov, Jury S.; Kuznetsova, Olga M.; Novakovskaya, Zoya D.; Kozlov, Vyacheslav I.; Korol, Vyacheslav K.; and Pershin, Nikolai I., 4,412,144., Cl. 310-49.00R.

Zilske, Wolfgang: *See*—
Kreuter, Erika; and Zilske, Wolfgang, 4,411,743., Cl. 204-47.000.

Zimmermann, Josef: *See*—
Dettbarn, Hans-Jurgen; and Zimmermann, Josef, 4,411,650., Cl. 604-72.000.

Zimmermann, Walter: *See*—
Schroder, Joris; Bosshard, Hans; Kiml, Jiri; Kostka, Miroslav; and Zimmermann, Walter, 4,411,337., Cl. 187-29.00R.

Zimmermann, Wilhelm, to Claudius Peters AG. Prefabricated aeration block for silo bases. 4,411,113., Cl. 52-303.000.

Zimmerschied, Alan B.: *See*—
Shrader, John E.; and Zimmerschied, Alan B., 4,411,198., Cl. 102-216.000.

Zingaretti, Gabriele: *See*—
Cimino, Andrea; Plicchi, Gianni; Mangiarotti, Luigi; Rossi, Maurizio; Betti, Vittorio; Spighi, Massimo; and Zingaretti, Gabriele, 4,411,918., Cl. 426-124.000.

Zitser, Vitaly A.; Bachelis, Leonid V.; Melnikov, Alexandr V.; Dreishev, Igor I.; Shishkin, Nikolai K.; Morozov, Jury E.; Ivanov, Vladimir A.; Olshansky, Semen A.; and Ryabinin, July V. Device for delivery of cores. 4,411,586., Cl. 414-728.000.

Zoecon Corporation: *See*—
Henrick, Clive A.; and Garcia, Barbara A., 4,411,912., Cl. 424-304.000.
Lindahl, George R., III; and Henrick, Clive A., 4,411,839., Cl. 260-465.00D.

Zoppetti, Giorgio: *See*—
Casu, Benito; Torri, Giangiacomo; and Zoppetti, Giorgio, 4,411,796., Cl. 210-692.000.

Zwetkow, Nikolaus: *See*—
Yu, Steven P.; Matunas, Frank C.; and Zwetkow, Nikolaus, 4,411,785., Cl. 210-321.100.

Zwirner, Gerhard: *See*—
Cziptschirsch, Kurt; Kaiser, Klaus-Peter; and Zwirner, Gerhard, 4,411,467., Cl. 296-97.00H.

501 Sharp Kabushiki Kaisha: *See*—
Yoshida, Kunio, 4,412,305., Cl. 364-900.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 25TH DAY OF OCTOBER, 1983

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Church & Dwight Co., Inc.: *See*—
Steinke, John J.; and Kaufman, George, Re. 31,425., Cl. 206-611.000.

Daiberl, Karl. Intra-oral aligning assembly. Re. 31,426., Cl. 433-72.000.

Dow Chemical Co., The: *See*—
Habermann, Clarence E.; and Tefertiller, Ben A., Re. 31,430., Cl. 564-127.000.

Ernsting, John; Morgan, Thomas R.; Palmer, Leonard F. W.; Rivers, Alfred J.; and Robson, Stephen M., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the, by said Ernsting, Palmer, River, and Robson; and United States of America, Air Force, by said Morgan. Respirators. Re. 31,424., Cl. 128-201.180.

Gass, Ernst, to Novotechnik KG Offterdinger & Co. Movable wiper for potentiometers. Re. 31,431., Cl. 338-202.000.

Habermann, Clarence E.; and Tefertiller, Ben A., to Dow Chemical Co., The. Catalysts for the hydration of nitriles to amides. Re. 31,430., Cl. 564-127.000.

Hartman, George D.: *See*—
Tull, Robert, deceased; Hartman, George D.; and Weinstock, Leonard M., Re. 31,429., Cl. 544-277.000.

Kaufman, George: *See*—
Steinke, John J.; and Kaufman, George, Re. 31,425., Cl. 206-611.000.

Lubsen, Timothy A.; Strobel, Rudolf G. K.; Reinhart, Richard N.; and Patel, Jayantilal M., to Procter & Gamble Company, The. Aroma-enriched coffee products and process. Re. 31,427., Cl. 426-594.000.

Merck & Co., Inc.: *See*—
Tull, Robert, deceased; Hartman, George D.; and Weinstock, Leonard M., Re. 31,429., Cl. 544-277.000.

Morgan, Thomas R.: *See*—
Ernsting, John; Morgan, Thomas R.; Palmer, Leonard F. W.; Rivers, Alfred J.; and Robson, Stephen M., Re. 31,424., Cl. 128-201.180.

Novotechnik KG Offterdinger & Co.: *See*—
Gass, Ernst, Re. 31,431., Cl. 338-202.000.

Palmer, Leonard F. W.: *See*—
Ernsting, John; Morgan, Thomas R.; Palmer, Leonard F. W.; Rivers, Alfred J.; and Robson, Stephen M., Re. 31,424., Cl. 128-201.180.

Patel, Jayantilal M.: *See*—
Lubsen, Timothy A.; Strobel, Rudolf G. K.; Reinhart, Richard N.; and Patel, Jayantilal M., Re. 31,427., Cl. 426-594.000.

Pedlow, J. Watson, to Thomas & Betts Corporation. Fire protective tape. Re. 31,428., Cl. 428-215.000.

Procter & Gamble Company, The: *See*—
Lubsen, Timothy A.; Strobel, Rudolf G. K.; Reinhart, Richard N.; and Patel, Jayantilal M., Re. 31,427., Cl. 426-594.000.

Reinhart, Richard N.: *See*—
Lubsen, Timothy A.; Strobel, Rudolf G. K.; Reinhart, Richard N.; and Patel, Jayantilal M., Re. 31,427., Cl. 426-594.000.

Rivers, Alfred J.: *See*—
Ernsting, John; Morgan, Thomas R.; Palmer, Leonard F. W.; Rivers, Alfred J.; and Robson, Stephen M., Re. 31,424., Cl. 128-201.180.

Robson, Stephen M.: *See*—
Ernsting, John; Morgan, Thomas R.; Palmer, Leonard F. W.; Rivers, Alfred J.; and Robson, Stephen M., Re. 31,424., Cl. 128-201.180.

Steinke, John J.; and Kaufman, George, to Church & Dwight Co., Inc. Resealable container. Re. 31,425., Cl. 206-611.000.

Strobel, Rudolf G. K.: *See*—
Lubsen, Timothy A.; Strobel, Rudolf G. K.; Reinhart, Richard N.; and Patel, Jayantilal M., Re. 31,427., Cl. 426-594.000.

Tefertiller, Ben A.: *See*—
Habermann, Clarence E.; and Tefertiller, Ben A., Re. 31,430., Cl. 564-127.000.

Thomas & Betts Corporation: *See*—
Pedlow, J. Watson, Re. 31,428., Cl. 428-215.000.

Tull, Robert, deceased; Hartman, George D.; and Weinstock, Leonard M., to Merck & Co., Inc. Process for preparation of 9(dihalobenzyl-)adenines. Re. 31,429., Cl. 544-277.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Ernsting, John; Morgan, Thomas R.; Palmer, Leonard F. W.; Rivers, Alfred J.; and Robson, Stephen M. (said Ernsting, Palmer, River, and Robson assors. to), Re. 31,424., Cl. 128-201.180.

United States of America
Air Force: *See*—
Ernsting, John; Morgan, Thomas R.; Palmer, Leonard F. W.; Rivers, Alfred J.; and Robson, Stephen M. (said Morgan assors. to), Re. 31,424., Cl. 128-201.180.

Weinstock, Leonard M.: *See*—
Tull, Robert, deceased; Hartman, George D.; and Weinstock, Leonard M., Re. 31,429., Cl. 544-277.000.

LIST OF DESIGN PATENTEES

ACA Products, Inc.: *See*—
Richardson, James E., 271,074., Cl. D7-318.000.

Alltrade, Inc.: *See*—
Hillinger, George, 271,076., Cl. D8-76.000.

American District Telegraph Company: *See*—
Gibbs, Terence E., 271,099., Cl. D13-12.000.

Apple Computer, Inc.: *See*—
Manock, Jerrold C.; and Stewart, James R., 271,102., Cl. D14-109.000.

Armstrong, Edward J. Game board. 271,117., 10-25-83, Cl. D21-34.000.

Bangor Punta Corporation: *See*—
Ferraro, Robert, 271,124., Cl. D22-1.000.
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46 4,411,152
79 4,411,153
118 4,411,154
295 4,411,155
432 R 4,411,156
721 4,411,[illegible]
768 [illegible]
843 4,411,160
861.03 4,411,161
862.65 4,411,162
864.02 4,411,163
864.81 4,411,157

CLASS 74

55 4,411,164
63 4,411,165
89 4,411,166
492 4,411,167
501 R 4,411,168
594.4 4,411,169
661 4,411,170
675 4,411,171
690 4,411,172
785 4,411,173
866 4,411,174

CLASS 75

44 S 4,411,695
51 4,411,696
60 4,411,697
121 4,411,698

CLASS 76

107 R 4,411,175

CLASS 81

15.8 4,411,176

CLASS 82

2 E 4,411,177
4 C 4,411,178
71 4,411,179

CLASS 83

37 4,411,180
150 4,411,181
319 4,411,182
581 4,411,183

CLASS 84

1.03 4,411,184
1.27 4,411,185
291 4,411,186
402 4,411,187

CLASS 89

20 A 4,411,188

CLASS 91

420 4,411,189
487 4,411,190

CLASS 101

38 A 4,411,191
111 4,411,192
148 4,411,193
216 4,411,194
226 4,411,195
269 4,411,196
291 4,411,197

CLASS 102

216 4,411,198
481 4,411,199
529 4,411,200

CLASS 10[illegible]

8 R 4,411,201
199 R 4,411,202

CLASS 106

23 4,411,699
4,411,700
87 4,411,701
111 4,411,702
189 4,411,703
308 Q 4,411,704

CLASS 110

341 4,411,203
347 4,411,204

CLASS [illegible]

1 [illegible]
34 [illegible]

CLASS [illegible]

79 A [illegible]
103 [illegible]
158 A [illegible]
199 [illegible]
265.2 [illegible]

CLASS [illegible]

125 [illegible]
312 [illegible]
347 [illegible]

CLASS 118

111 4,411,215
117 4,411,216
212 4,411,217
411 4,411,218
505 4,411,219

CLASS 119

1 4,411,220
44 4,411,221
96 4,411,222

CLASS 123

3 4,411,223
25 A 4,411,224
73 AD 4,411,225
188 M 4,411,226
196 R 4,411,227
198 F 4,411,228
4,411,229
4,411,230
339 4,411,231
389 4,411,244
438 4,411,232
439 4,411,233
485 4,411,234
488 4,411,235
492 4,411,236
501 4,411,237
4,411,238
557 4,411,239
4,411,240
568 4,411,241
569 4,411,242
577 4,411,243
609 4,411,245
644 4,411,246
655 4,411,247

CLASS 124

20 R 4,411,248
64 4,411,249

CLASS 125

11 CD 4,411,250

CLASS 126

165 4,411,251
201 4,411,252
242 4,411,253
300 4,411,254
429 4,411,255
441 4,411,256

CLASS 128

6 [illegible]
60 [illegible]
69 [illegible]
79 [illegible]
90 4,411,262
132 R [illegible]
201.18 [illegible]
201.23 [illegible]
303.1 4,411,265
303.18 4,411,266
385 4,411,267
421 4,411,268
482 4,411,269
653 4,411,270
703 4,411,271
711 4,411,272
731 4,411,273
738 4,411,274
763 4,411,275
784 4,411,276
4,411,277

CLASS 131

[illegible] 4,411,278
[illegible] 4,411,279
[illegible] 4,411,280

CLASS 132

R 4,411,281
[illegible] 4,411,282

CLASS 134

[illegible] 4,411,705
[illegible] 4,411,706

CLASS 135

[illegible] 4,411,283
81 4,411,284

CLASS 136

230 4,412,090
258 4,412,091

CLASS 137

112 4,411,285
253 4,411,286
315 4,411,287
363 4,411,288
486 4,411,289
615 4,411,290
624.15 4,411,291

CLASS 138

42 4,411,292

CLASS 139

110 4,411,293
435 4,411,294

CLASS 141

59 4,411,295
98 4,411,296

CLASS 144

129 4,411,297
193 A 4,411,298
193 R 4,411,299

CLASS 148

1.5 4,411,708
2 4,411,707
3 4,411,709
6.14 R 4,411,710
11.5 A 4,411,711
11.5 Q 4,411,712
35 4,411,713
111 4,411,714
131 4,411,715
403 4,411,716

CLASS 149

18 4,411,717
74 4,411,718

CLASS 150

51 4,411,300

CLASS 152

[illegible] R 4,411,301
[illegible] 4,411,302

CLASS 156

[illegible] 4,411,719
69 4,411,720
75.1 4,411,721
[illegible]97 4,411,722
242 4,411,723
304.1 4,411,724
35[illegible] 4,411,725
423 4,411,726
[illegible] 4,411,727
[illegible] 4,411,728
612 4,411,729
626 4,411,730
630 4,411,731
643 4,411,732
4,411,733
4,411,734
659.1 4,411,735

CLASS 159

47.1 4,411,736

CLASS 162

7 4,411,737
142 4,411,738

CLASS 164

182 4,411,303
448 4,411,304
529 4,411,305

CLASS 165

12 4,411,306
70 4,411,307
4,411,308
76 4,411,309
166 4,411,310
170 4,411,311

CLASS 166

75 R 4,411,312
90 4,411,313
124 4,411,314
187 4,411,315
323 4,411,316
347 4,411,317

CLASS 169

26 4,411,318

CLASS 172

10 4,411,319
13 4,411,320
40 4,411,321
540 4,411,322
799.5 4,411,323

CLASS 174

36 4,412,092
52 FP 4,412,093
110 F 4,412,094
158 R 4,412,095

CLASS 175

289 4,411,324

CLASS 177

136 4,411,325
211 4,411,326
4,411,327
212 4,411,328

CLASS 179

7.1 R 4,412,101
99 M 4,412,102
115.5 R 4,412,103
117 4,412,104
121 R 4,412,105
156 R 4,412,106

CLASS 180

7 R 4,411,329
8 A 4,411,330
78 4,411,331
89.14 4,411,332
219 4,411,333
274 4,411,334

CLASS 182

83 4,411,335

CLASS 186

37 4,411,336

CLASS 187

29 R 4,411,337
4,411,338

CLASS 188

67 4,411,339
296 4,411,340
310 4,411,341
315 4,411,342

CLASS 190

18 A 4,411,343
4,411,344

CLASS 191

23 A 4,412,107

CLASS 192

12 C 4,411,345
85 A 4,411,346
88 B 4,411,347
139 4,411,348

CLASS 193

35 A 4,411,350
35 R 4,411,349

CLASS 194

4 C 4,411,351

CLASS 198

328 4,411,352
425 4,411,353
472 4,411,354
718 4,411,355
721 4,411,356
802 4,411,357

CLASS 200

5 R 4,412,108
16 C 4,412,109
38 R 4,412,110
47 4,412,111
50 AA 4,412,112
61.08 4,412,114
67 DB 4,412,113
148 A 4,412,115
155 R 4,412,116

CLASS 203

24 4,411,739
58 4,411,740

CLASS 204

1 T 4,411,741
16 4,411,742
47 4,411,743
49 4,411,744
59 R 4,411,745
4,411,746
67 4,411,747
70 4,411,748
98 4,411,749
4,411,750
129.85 4,411,751
158 HA 4,411,752
158 R 4,411,753
159.15 4,411,754
163 R 4,411,755
176 4,411,756
192 E 4,411,757
243 R 4,411,758
260 4,411,759
270 4,411,760
290 F 4,411,762
290 R 4,411,761
298 4,411,763
411 4,411,764

CLASS 206

45.34 4,411,358
217 4,411,359
313 4,411,360
329 4,411,361
330 4,411,362
388 4,411,363
466 4,411,364
607 4,411,365
611 Re.31,425

CLASS 208

8 LE 4,411,765
10 4,411,766
4,411,767
54 4,411,769
59 4,411,768
111 4,411,770
112 4,411,771
120 4,411,777
121 4,411,772
164 4,411,773
179 4,411,774
188 4,411,775
206 4,411,776

CLASS 209

246 4,411,778
648 4,411,366

CLASS 210

108 4,411,779
150 4,411,780
195.2 4,411,781
230 4,411,782
304 4,411,783
321.1 4,411,784
4,411,785
321.3 4,411,786
321.5 4,411,787
439 4,411,788
635 4,411,789
637 4,411,790
649 4,411,791
651 4,411,792
656 4,411,793
670 4,411,794
679 4,411,795
692 4,411,796
727 4,411,797
4,411,798
753 4,411,799

CLASS 211

187 4,411,367

CLASS 212

149 4,411,368
373 4,411,817

CLASS 215

21 4,411,369

CLASS 219

10.55 F 4,412,117
69 W 4,412,118
121 LG 4,412,120
121 PF 4,412,119
124.34 4,412,121
137 R 4,412,122
233 4,412,123
277 4,412,124
549 4,412,125
553 4,412,126

CLASS 220

269 4,411,370
314 4,411,371
327 4,411,372
470 4,411,373

CLASS 221

63 4,411,374
90 4,411,375

CLASS 222

212 4,411,376
342 4,411,377

CLASS 227

19 4,411,378

CLASS 228

52 4,411,379
181 4,411,380
4,411,381

CLASS 229

16 D 4,411,382
52 B 4,411,383

CLASS 237

2 A 4,411,385
2 B 4,411,384

CLASS 239

177 R 4,411,386
345 4,411,387
419.5 4,411,388
427.5 4,411,389

CLASS 241

98 4,411,390
232 4,411,391

CLASS 242

35.5 R 4,411,392
75.43 4,411,393
83 4,411,394
106 4,411,395
158 R 4,411,396
192 4,411,397

CLASS 244

3.28 4,411,398
130 4,411,399

CLASS 248

216.1 4,411,400
262 4,411,401
284 4,411,402
575 4,411,403

CLASS 249

3 4,411,404

CLASS 250

204 4,412,127
213 VT 4,412,128
239 4,412,129
260 4,412,130
305 4,412,131
396 ML 4,412,132
492.2 4,412,133
504 R 4,412,134
551 4,412,135

CLASS 251

129 4,411,406
306 4,411,405
315 4,411,407

CLASS 252

8.5 A 4,411,800
8.5 P 4,411,801
8.55 D 4,411,802
8.75 4,411,803
29 4,411,804
47 4,411,805
49.6 4,411,806
62.58 4,411,807
78.1 4,411,808
91 4,411,809
99 4,411,810
182 4,411,811
299.1 4,411,812
312 4,411,813
315.1 4,411,819
344 4,411,814
353 4,411,815
356 4,411,816
503 4,411,825
518 4,411,826
521 4,411,827
522 R 4,411,828
4,411,829
4,411,830
554 4,411,831

CLASS 254

108 4,411,408
134.3 FT 4,411,409

CLASS 260

121 4,411,832
239.55 R 4,411,833
365 4,411,834
397.45 4,411,835
455 B 4,411,837
455 R 4,411,836
463 4,411,838
465 D 4,411,839
501.12 4,411,840
543 F 4,411,841
543 P 4,411,842
544 Y 4,411,843

CLASS 261

34 R 4,411,844
65 4,411,845
98 4,411,846

CLASS 264

7 4,411,847
40.5 4,411,848
45.5 4,411,849
105 4,411,850
137 4,411,851
171 4,411,852
176 F 4,411,853
205 4,411,854
219 4,411,855
267 4,411,856

CLASS 266

54 4,411,410
66 4,411,411
242 4,411,412

CLASS 269

48.1 4,411,413
71 4,411,414
134 4,411,415

CLASS 271

11 4,411,416
94 4,411,417
236 4,411,418
263 4,411,419
276 4,411,420

CLASS 272

73 4,411,421
96 4,411,422
117 4,411,423
118 4,411,424
123 4,411,425
126 4,411,426

CLASS 273

67 R 4,411,427
143 R 4,411,428
164 4,411,429
171 4,411,430
183 C 4,411,431
251 4,411,432
260 4,411,433

CLASS 277

9.5 4,411,435
27 4,411,434
53 4,411,436
4,411,437
105 4,411,438
188 A 4,411,439

CLASS 279

5 4,411,440

CLASS 280

5 A 4,411,441
221 4,411,442
281 LP 4,411,443
405 A 4,411,444
615 4,411,445
628 4,411,446
714 4,411,447
802 4,411,448
804 4,411,449

CLASS 282

27.5 4,411,450
4,411,451
4,411,452

CLASS 285

18 4,411,453
26 4,411,454
39 4,411,455
4,411,456
52 4,411,457
196 4,411,458
197 4,411,459
243 4,411,460

CLASS 290

40 R 4,412,136

CLASS 293

108 4,411,461
132 4,411,462

CLASS 294

19 A 4,411,463

CLASS 296

97 H 4,411,467
102 4,411,464
146 4,411,465
188 4,411,466

CLASS 297

264 4,411,468
300 4,411,469
410 4,411,470
417 4,411,471
430 4,411,472
484 4,411,473

CLASS 299

4 4,411,474
81 4,411,475

CLASS 303

6 C 4,411,476
22 R 4,411,477

CLASS 307

10 R 4,412,137
264 4,412,138
270 4,412,139
311 4,412,140
471 4,412,141
477 4,412,142
530 4,412,143

CLASS 308

6 C 4,411,478
195 4,411,479

CLASS 310

49 R 4,412,144
154 4,412,145
266 4,412,146
320 4,412,147
358 4,412,148

CLASS 312

7.2 4,411,480
8 4,411,481
233 4,411,482

CLASS 313

414 4,412,149

CLASS 315

4 4,412,150
55 4,412,151
73 4,412,152
111.81 4,412,153
224 4,412,154
246 4,412,155
308 4,412,156
387 4,412,157

CLASS 318

254 4,412,159
257 4,412,158
280 4,412,160
561 4,412,161
563 4,412,162
567 4,412,163
596 4,412,164
636 4,412,165
696 4,412,166
729 4,412,167

CLASS 320

48 4,412,168
64 4,412,169

CLASS 322

4 4,412,170
20 4,412,171

CLASS 324

56 4,412,172
62 4,412,173
65 CR 4,412,174
71.1 4,412,175
204 4,412,176
226 4,412,177
303 4,412,178
4,412,179
373 4,412,180

CLASS 329

50 4,412,181

CLASS 330

59 4,412,182
68 4,412,183
69 4,412,184
149 4,412,185
288 4,412,186

CLASS 331

108 D 4,412,187
176 4,412,188

CLASS 333

14 4,412,189
165 4,412,190
193 4,412,191
257 4,412,192

CLASS 335

18 4,412,193
210 4,412,194
216 4,412,195
250 4,412,196
256 4,412,197

CLASS 336

70 4,412,199
120 4,412,198
139 4,412,200
192 4,412,201

CLASS 337

171 4,412,202

CLASS 338

4 4,412,203
202 Re.31,431

CLASS 339

17 M 4,411,483
97 C 4,411,484
125 R 4,411,485
147 R 4,411,486

CLASS 340

59 4,412,204
331 4,412,205
347 AD 4,412,207
347 DA 4,412,208
347 P 4,412,206
365 C 4,412,209
365 S 4,412,210
514 4,412,211
684 4,412,212
753 4,412,213
765 4,412,214
785 4,412,215
825.31 4,412 216
825.44 4,417,217
825.56 4,417,218

CLASS 343

6.8 R 4,412,219
55 C 4,412,220
705 4,412,221
779 4,412,222
844 4,412,223

CLASS 346

1.1 4,412,224
4,412,225
4,412,226
76 PH 4,412,227
4,412,228
108 4,412,229
110 R 4,412,230
135.1 4,412,231
140 R 4,412,232
4,412,233

CLASS 350

1.1 4,411,487
1.4 4,411,488
3.76 4,411,489
96.10 4,411,490
96.21 4,411,491
173 4,411,492
262 4,411,493
339 R 4,411,494
347 E 4,411,496
347 V 4,411,495
357 4,411,497
429 4,411,498
442 4,411,499
446 4,411,500

CLASS 351

202 4,411,501
206 4,411,502

CLASS 352

222 4,411,503

CLASS 354

25 4,411,504
4,411,505
145 4,411,506
195 4,411,507
198 4,411,508
212 4,411,509
272 4,411,510

CLASS 355

3 TR 4,411,511
4,411,512
5 4,411,513
14 CH 4,411,514
14 SH 4,411,515
4,411,517
67 4,411,516

CLASS 356

39 4,411,518
45 4,411,519
73.1 4,411,520
225 4,411,521
240 4,411,522
246 4,411,523
313 4,411,524
339 4,411,525
350 4,411,526
4,411,527
375 4,411,528
421 4,411,529

CLASS 357

17 4,412,234
19 4,412,235
31 4,412,236
42 4,412,237
43 4,412,238
44 4,412,239
45 4,412,240
51 4,412,241
52 4,412,242

CLASS 358

22 4,412,244
86 4,412,245
107 4,412,246
111 4,412,247
112 4,412,248
4,412,249
150 4,412,250
160 4,412,251
4,412,252
167 4,412,253
243 4,412,254
245 4,412,255

283 4,412,256
334 4,412,243

CLASS 360

45 4,412,257
62 4,412,258
77 4,412,259
97 4,412,260
98 4,412,261
109 4,412,262
128 4,412,263
131 4,412,264

CLASS 361

18 4,412,265
24 4,412,266
94 4,412,267
181 4,412,268
263 4,412,269
284 4,412,270
370 4,412,271
383 4,412,272

CLASS 362

211 4,412,273
269 4,412,274
4,412,275
278 4,412,276

CLASS 363

81 4,412,277
126 4,412,278
128 4,412,279

CLASS 364

200 4,412,280
4,412,281
4,412,282
4,412,283
4,412,284
4,412,285
4,412,286
408 4,412,287
413 4,412,288
414 4,412,289
424.1 4,412,290
426 4,412,291
479 4,412,292
513 4,412,293
518 4,412,294
520 4,412,295
521 4,412,296
559 4,412,297
567 4,412,298
570 4,412,299
709 4,412,300
728 4,412,301
4,412,302
900 4,412,303
4,412,304
4,412,305
4,412,306

CLASS 365

8 4,412,307
105 4,412,308
184 4,412,309
185 4,412,310
4,412,311
189 4,412,312
221 4,412,313
222 4,412,314

CLASS 366

4 4,411,530
76 4,411,531
99 4,411,532

CLASS 367

4,412,315
105 4,412,316
185 4,412,317

CLASS 369

41 4,412,318
43 4,412,319
79 4,412,320
233 4,412,321

CLASS 370

16 4,412,323
58 4,412,322
4,412,324
70 4,412,325
85 4,412,326

CLASS 371

21 4,412,327
25 4,412,328
47 4,412,329

CLASS 372

29 4,412,330
4,412,331
70 4,412,332
87 4,412,333

CLASS 373

40 4,412,334

CLASS 374

125 4,411,533
141 4,411,534
165 4,411,535
184 4,411,536
185 4,411,537

CLASS 375

3 4,412,335
4 4,412,336
60 4,412,337
82 4,412,338
95 4,412,339
96 4,412,340
102 4,412,341
107 4,412,342

CLASS 376

233 4,411,857
247 4,411,858
4,411,859
338 4,411,860
417 4,411,861
442 4,411,862

CLASS 377

58 4,412,343
60 4,412,344

CLASS 378

078 4,412,345
181 4,412,346

CLASS 381

43 4,412,098
51 4,412,099
60 4,412,096
92 4,412,097
100 4,412,100

CLASS 400

124 4,411,538
144.2 4,411,539
175 4,411,540
213 4,411,541
697.1 4,411,542

CLASS 401

53 4,411,543

CLASS 402

69 4,411,544

CLASS 403

12 4,411,545
23 4,411,546
205 4,411,547
232.1 4,411,548
258 4,411,549
358 4,411,550
370 4,411,551
388 4,411,552

CLASS 404

16 4,411,553
110 4,411,554

CLASS 405

50 4,411,555
213 4,411,556
238 4,411,557
294 4,411,558
300 4,411,559

CLASS 406

128 4,411,560
137 4,411,561
157 4,411,562

CLASS 407

54 4,411,563
113 4,411,564
114 4,411,565
119 4,411,566

CLASS 409

82 4,411,567
233 4,411,568
261 4,411,569

CLASS 411

271 4,411,570

CLASS 414

24.5 4,411,571
4,411,572
24.6 4,411,573
121 4,411,574
217 4,411,575
226 4,411,576
274 4,411,577
300 4,411,578
417 4,411,579
462 4,411,580
489 4,411,581
636 4,411,582
687 4,411,583
694 4,411,584
724 4,411,585
728 4,411,586
752 4,411,587

CLASS 415

2 A 4,411,588
9 4,411,589
26 4,411,590
103 4,411,591
119 4,411,592
173 R 4,411,593
174 4,411,594

CLASS 416

1 4,411,595
51 4,411,596
92 4,411,597
223 R 4,411,598

CLASS 417

301 4,411,599
312 4,411,600
388 4,411,601
437 4,411,602
479 4,411,603

CLASS 418

55 4,411,604
4,411,605
61 B 4,411,606
4,411,607

CLASS 420

580 4,411,863
587 4,411,864

CLASS 422

16 4,411,865
25 4,411,866
91 4,411,867
104 4,411,868
188 4,411,869
4,411,870
232 4,411,871
310 4,411,872

CLASS 423

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87 4,411,874
242 4,411,875
311 4,411,876
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CLASS 424

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33 4,411,882
47 4,411,883
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52 4,411,885
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273 B 4,411,907
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279 4,411,910
283 4,411,911
304 4,411,912
330 4,411,913

CLASS 425

123 4,411,608
149 4,411,609
174.4 4,411,610
237 4,411,611
365 4,411,612
388 4,411,613
466 4,411,614
591 4,411,615

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104 4,411,917
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594 Re.31,427
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CLASS 428

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187 4,411,617
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173 4,411,624
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287 4,412,003

CLASS 436

10 4,412,004
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110 4,412,006
139 4,412,007

CLASS 440

42 4,411,630
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172 4,411,636
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CLASS 474

138 4,411,638
902 4,411,639

CLASS 493

45 4,411,640
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CLASS 494

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CLASS 501

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129 4,412,014

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232 4,412,067
315 4,412,061
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CLASS 542

429 4,412,069

CLASS 544

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298 4,412,074

CLASS 546

153 4,412,075
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298 4,412,077

CLASS 548

110 4,412,078
141 4,412,079

CLASS 556

460 4,412,080
4,412,081

CLASS 562

478 4,412,082

CLASS 564

127 Re.31,430
279 4,412,083

CLASS 568

852 4,412,084
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CLASS 570

262 4,412,086

CLASS 585

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151 4,411,651
153 4,411,652
157 4,411,653
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212 4,411,656
274 4,411,657
285 4,411,658
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411 4,411,661
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CLASSIFICATION OF DESIGNS

D2—	234	271,059		391	271,075		153	271,091		85	271,107		253	271,123	D26—	24	271,139
	365	271,060	D8—	76	271,076	D12—	92	271,092		126	271,108	D22—	1	271,124		42	271,140
	400	271,061		358	271,077		102	271,093			271,109			271,125		74	271,141
D3—	28	271,062			271,078			271,094			271,110		7	271,126		120	271,142
	35	271,063		359	271,080		300	271,095			271,111		24	271,127			271,143
		271,064		395	271,079		316	271,096		140	271,112		25	271,128	D29—	9	271,144
D6—	69	271,065	D9—	341	271,081			271,097	D16—	27	271,113	D23—	72	271,129	D32—	1	271,145
	72	271,066		377	271,082			271,098	D17—	22	271,114		97	271,130		4	271,146
	114	271,067		389	271,083	D13—	12	271,099	D19—	47	271,115			271,131		6	271,147
	151	271,068			271,084		24	271,100	D21—	12	271,116		123	271,132			271,148
	186	271,069	D10—	46	271,085	D14—	100	271,101		34	271,117		155	271,133		48	271,149
	191	271,070		50	271,086		109	271,102		41	271,118		163	271,134	D34—	33	271,150
	203	271,071		61	271,087		113	271,103		124	271,119	D24—	17	271,135		35	271,151
D7—	3	271,072		69	271,088	D15—	9.2	271,104		143	271,120			271,136		38	271,152
	70	271,073		121	271,089		10	271,105		163	271,121		38	271,137		40	271,153
	318	271,074	D11—	131	271,090		72	271,106		252	271,122	D25—	72	271,138			

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California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
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Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

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